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**ENVIRONMENTAL ASSESSMENT  
OF THE RELOCATION  
OF A WEATHER TRAINING DIVISION  
TO KEESLER AIR FORCE BASE,  
BILOXI, MISSISSIPPI**

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Prepared for:

**THE DEPARTMENT OF THE AIR FORCE**  
Headquarters Air Training Command  
Randolph Air Force Base, Texas

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**COVER SHEET**

Environmental Assessment of the  
Relocation of a Weather Training Division to  
Keesler Air Force Base (AFB), Biloxi, Mississippi

Responsible Agency: United States Air Force

Action: In response to the recommendations of the Defense Secretary's Commission on Base Realignments and Closures to legislative requirements in the Base Closure and Realignment Act (Public Law 100-526), Chanute AFB (Rantoul, Illinois) is to be closed. The training courses now offered in the Weather Training Division at Chanute AFB will be relocated to Keesler AFB.

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Designation: Environmental Assessment (EA)

Abstract: This assessment contains an analysis of the potential environmental impacts of the relocation of the Weather Training Division and reallocation of personnel authorizations from Chanute AFB to Keesler AFB. The action at Keesler AFB includes the construction of a Weather Training Facility, demolition of two existing buildings at the Weather Training Facility site, installation of the Next Generation Weather Radar (NEXRAD) system, and renovations to a dormitory, a dining hall, and a technical training building. No significant impacts are expected from the action.

## EXECUTIVE SUMMARY

The action detailed in this assessment is the relocation of the Weather Training Division and the reallocation of personnel authorizations from Chanute AFB (Rantoul, Illinois) to Keesler AFB (Biloxi, Mississippi) as part of the Secretary of Defense's decision regarding base realignments and closures. Impacts associated with the closure of Chanute AFB and with its ultimate disposal and reuse are being addressed in two separate Environmental Impact Statements (EISs). Impacts associated with relocation of the other training functions currently located at Chanute AFB are also being addressed in separate EAs.

The action at Keesler AFB includes the construction of a Weather Training Facility, demolition of two existing buildings at the Weather Training Facility site, installation of the Next Generation Weather Radar (NEXRAD) system, and renovations to a dormitory, a dining hall, and a technical training building. This EA primarily addresses the construction phase of the NEXRAD radar antenna. Operational aspects and potential impacts will be further evaluated when a specific antenna site is determined.

Provisions of the Base Closure and Realignment Act preclude the examination of any alternative actions to closure (including the "no action" alternative) or alternative installations to those selected. However, alternatives for the location of the facilities within Keesler AFB must be considered and are discussed in Section 2.

No significant environmental impact is expected as a result of the action. The following presents a summary of potential environmental impacts by the different areas addressed.

**Physiography and Topography:** Limited soil erosion will occur during site preparation and construction of the Weather Training Facility and NEXRAD radome and tower pad.

**Surface Water:** Temporary, localized decreases in the quality of water receiving stormwater runoff from the sites could occur during construction. Impacts will be minimized by following standard erosion and sedimentation control measures including the use of silt fences.

**Groundwater:** No significant impact.

**Air Quality:** Localized, temporary impacts during construction primarily from construction equipment emissions and dust emissions.

**Noise:** No significant impact.

**Vegetation:** Construction of the NEXRAD radome and tower will result in the elimination of approximately 10,000 square feet of natural pine forest or partially cleared areas.

Wildlife: No direct impacts except removal of wildlife habitat (consisting of pine trees and understory vegetation in approximately 10,000 square foot area) at the NEXRAD radome and tower site.

Demographics: Total population increase to the area including permanent personnel and students is estimated to average 1,258 persons at any given time. This is less than 1 percent of the current county population and will result in a 3.1 percent increase for permanent party personnel and a 9.6 percent increase in students at Keesler AFB.

Economic Activity: Economic activities include an estimated \$1.5 million project cost for alteration of a dormitory and a dining hall and \$8.6 million for construction of the training complex and other facilities for the Weather Training Division.

Income: Total estimated annual payroll for permanent personnel associated with the Weather Training Division is \$4.9 million. Student payroll is also estimated to be about \$4.9 million.

Land Use: No significant land use incompatibilities were identified.

Housing: Sufficient on-base and off-base housing is available to accommodate the incoming personnel.

Public Utilities and Services: All utilities and services are adequate to supply needs except for the wastewater lift station on Keesler AFB which is currently operating at or near capacity and limited by the size of the pipeline connecting it to the regional treatment plant.

Installation Restoration Program: No impact.

Cultural Resources: No impact. Any historical artifacts uncovered during construction will be reported to the State Historic Preservation Office.

It is concluded that the action will have no significant adverse effects on the environment. There has not been, nor is there currently, any known controversy concerning the proposed action. Based upon this Environmental Assessment, it is concluded that no additional environmental documentation is required.

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**LIST OF ACRONYMS AND ABBREVIATIONS**

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2AZR	Navy Oceanographic Courses
AAA	American Automobile Association
AFB	Air Force Base
AFESC	Air Force Engineering and Services Center
AFR	Air Force Regulation
AICP	American Institute of Certified Planners
AICUZ	Air Installation Compatible Use Zone
AM	amplitude modulation
AWS	Air Weather Service
Btu/SF/YR	British thermal units/square foot/year
Btu	British thermal unit
C2	Category 2 - Under review for listing, but substantial evidence of biological vulnerability and/or threat is lacking
C3	Category 3 - Species is more abundant and/or widespread than previously believed.
CEQ	(President's) Council on Environmental Quality
CI	Critically Imperiled
CO	Carbon monoxide
CST	Central Standard Time
dBA	A-weighted decibel
DNL (Ldn)	day night average sound level system
DOD	Department of Defense
E	Endangered
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMCS	Energy Management Control System
EPA	Environmental Protection Agency
EtB	Eustis loamy sand
FM	frequency modulation
FWS/OBS	(U.S.) Fish and Wildlife Service, Office of Biological Services
FY	Fiscal Year

**LIST OF ACRONYMS AND ABBREVIATIONS**

(Page 2 of 3)

gpm	gallons per minute
HUD	(U.S.) Department of Housing and Urban Development
Hz	hertz
I	Imperiled
I-	Interstate-
IRP	Installation Restoration Program (DOD)
JP4	jet petroleum (4)
kW	kilowatt
MASGP	Mississippi-Alabama Sea Grant Publication
MBPC	(Mississippi Department of Natural Resources), Bureau of Pollution Control
MDWC	Mississippi Department of Wildlife Conservation
MGD	million gallons per day
MNHP	Mississippi Natural Heritage Program
MOGAS	motor gasoline
mph	miles per hour
MSA	Metropolitan Statistical Area
msl	(above) mean sea level
MSP	Master of Science Planning
NASA	National Aeronautic and Space Administration
NEPA	National Environmental Policy Act
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NEXRAD	Next Generation Weather Radar
NEXRAD PEIS	Next Generation Weather Radar Programmatic Environmental Impact Statement
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
PA/SI	Preliminary Assessment/Site Investigation
PM <sub>10</sub>	concentration of particles less than 10 microns (measured in micrograms per cubic meter)

**LIST OF ACRONYMS AND ABBREVIATIONS**  
(Page 3 of 3)

ppm	parts per million
ppt	parts per thousand
psi	pounds per square inch
R	Rare
RI/FS	Remedial Investigation/Feasibility Study
RuB, RuC	Ruston fine, sandy loam (soils)
S	Species of Special Concern
SOUTHDIVNAVFACENGCOM	Southern Division, Naval Facilities Engineering Command
SU	Status Uncertain
T	Threatened
TATB	Weather Technician Course
TATC	Advanced Airman Forecaster Course
TATD	Advanced Weather Officer Course
TSP	total suspended particulates
USACOE	United States Army Corps of Engineers
USAF	United States Air Force
USDOC	United States Department of Commerce
USGS	United States Geological Survey
um	micrometers
WAR	Water and Air Research, Inc.

## **1.0 INTRODUCTION**

This environmental assessment (EA) evaluates the relocation of the Weather Training Division and the reallocation of personnel authorizations from Chanute AFB (Rantoul, Illinois) to Keesler AFB (Biloxi, Mississippi) as part of the base closure and realignment policy. This action includes the construction of a Weather Training Facility, demolition of two existing buildings at the Weather Training Facility site, construction of the Next Generation Weather Radar (NEXRAD) system, and renovations to a dormitory, a dining hall, and a technical training building at Keesler AFB.

### **1.1 PURPOSE OF AND NEED FOR THE ACTION**

The Defense Secretary's Commission on Base Realignment and Closure (Commission) was chartered on May 3, 1988, by the Secretary of Defense to recommend military installations within the United States, its commonwealths, territories, and possessions for realignment and closure. Subsequently, the Base Closure and Realignment Act (Public Law 100-526, October 24, 1988) endorsed the Secretary's Commission and required the Secretary of Defense to implement its recommendations unless either he rejected them in their entirety or the Congress passed (and the President signed) a Joint Resolution disapproving the Commission's recommendations.

The primary criterion used by the Commission for identifying candidate bases was the military value of the installation. However, cost savings were also considered, as were the current and project plans and requirements for each military service. Lastly, the Commission focused its review on military properties and their uses, not military units or organizational/administrative issues.

On December 29, 1988, the Commission recommended the realignment and closure of 145 military installations. Of this number, 86 are to be

11/29/89

closed fully, 5 are to be closed in part, and 54 will experience a change (either an increase or decrease) as units and activities are relocated.

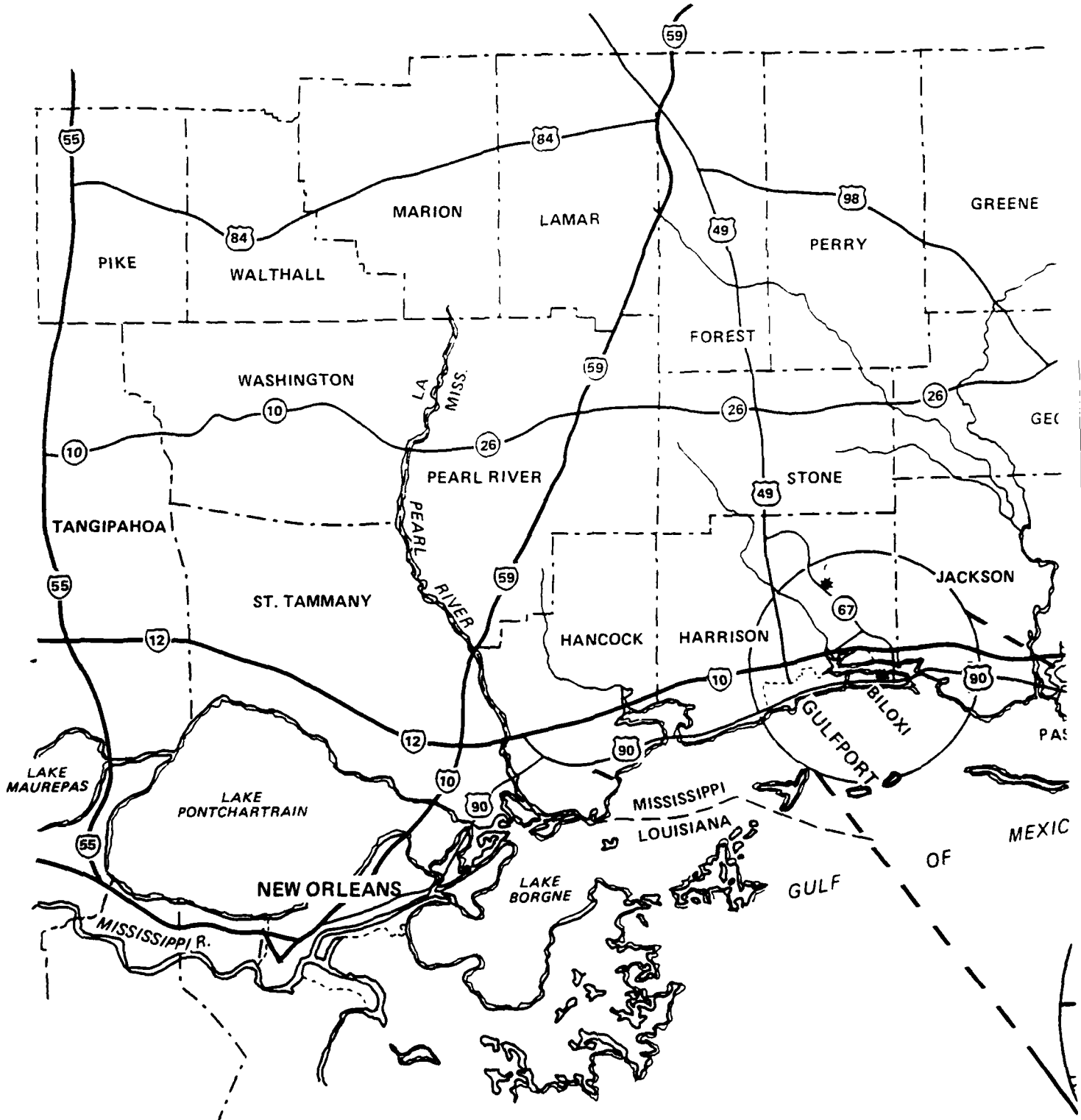
On January 5, 1989, the Secretary of Defense approved those recommendations and announced that the Department of Defense (DOD) would implement them. The Congress did not pass a Joint Resolution disapproving the recommendations within the time allotted by the Base Closure and Realignment Act (Act).

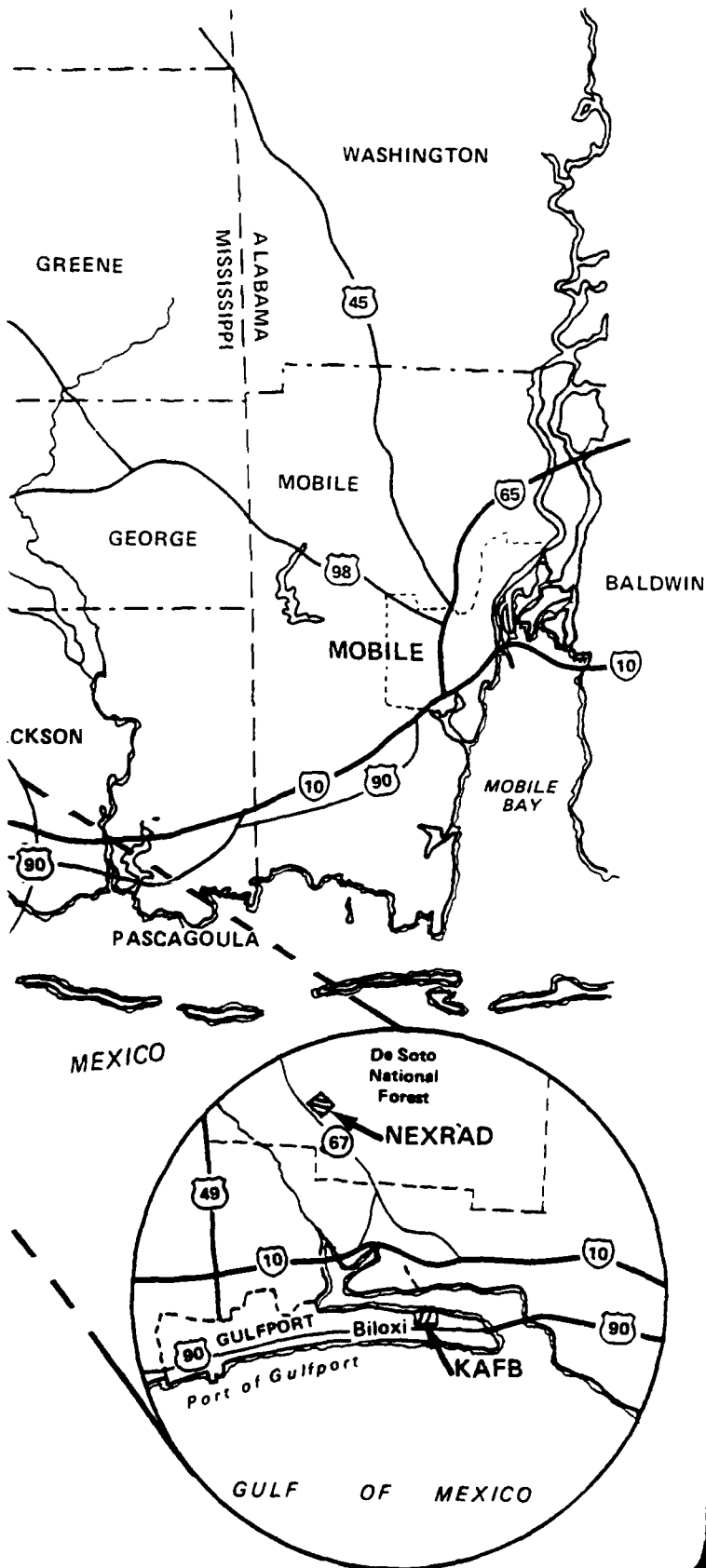
Therefore, the Act now requires the Secretary of Defense, as a matter of law, to implement those closures and realignments. Implementation must be initiated by September 30, 1991, and must be completed no later than September 30, 1995. Thus, this EA addresses only implementation; the decision to close Chanute AFB is by law a final one.

## 1.2 LOCATION OF THE ACTION

Keesler AFB is located within the city limits of Biloxi, Mississippi, approximately halfway between New Orleans, Louisiana and Mobile, Alabama. Biloxi is part of the Biloxi-Gulfport Metropolitan Statistical Area (MSA) which includes Harrison, Hancock, and Stone Counties. Biloxi was established in 1699 by French settlers and is one of the oldest continuously occupied cities in the United States. The City of Gulfport is immediately west of Biloxi. Gulfport, platted in 1885 and incorporated in 1898, is the Harrison County seat and an active commercial port.

The base is bordered (see Figure 1-1) on the east, west, and south by residential and commercial areas and on the north by the Back Bay of Biloxi. The base is approximately 0.5 mile north of Mississippi Sound. Except for the construction of the NEXRAD radar antenna on military property in the De Soto National Forest northwest of Keesler AFB, all associated construction and renovation projects addressed in this EA will occur on Keesler AFB.





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SCALE IN MILES

ENVIRONMENTAL ASSESSMENT OF THE  
RELOCATION OF A WEATHER TRAINING  
FACILITY TO KEESLER AIR FORCE BASE  
BILOXI, MISSISSIPPI

FIGURE 1-1. Location of Keesler AFB and  
NEXRAD Site, Biloxi, Mississippi

SOURCE: AAA 1986.  
WAR 1989.

### 1.3 SCOPE OF THE ENVIRONMENTAL REVIEW

The Base Closure and Realignment Act requires the implementing actions to conform to the provisions of the National Environmental Policy Act of 1969 (NEPA), as implemented by the President's Council on Environmental Quality (CEQ) regulations. In addition, this EA also follows Air Force Regulation (AFR) 19-2, which implements both NEPA and the CEQ regulations within the Air Force system. However, the Act also modified NEPA to the extent that the environmental analysis need not consider:

- (i) The need for closing or realigning a military installation selected for closure or realignment by the Commission.
- (ii) the need for transferring functions to another military installation which has been selected as the receiving installation; or
- (iii) alternative military installations to those selected.

Therefore, impacts associated with the closure of Chanute AFB and with its ultimate disposal and reuse are being addressed in two separate Environmental Impact Statements (EISs). Impacts associated with relocation of the other training functions currently located at Chanute AFB are also being addressed in separate EAs. Impacts associated with NEXRAD are addressed in the NEXRAD Programmatic Environmental Impact Statement (USDOC 1984).

This assessment will examine the current environmental and socioeconomic conditions in the vicinity of Keesler AFB. In addition, the potential consequences of the action to relocate the Weather Training Division to Keesler AFB will be investigated. Specific factors considered will relate to the impacts of construction of the new facilities, renovation of current facilities, and the socioeconomic and environmental impacts of the increased number of personnel at Keesler AFB and in the surrounding community. This EA addresses the construction and installation of the NEXRAD system as part of the Weather Training Facility. Operational aspects and impacts of the NEXRAD antenna will be further evaluated when a specific antenna site is determined.

## **2.0 DESCRIPTION OF THE ACTION AND ALTERNATIVES**

### **2.1 ALTERNATIVES CONSIDERED**

The Base Closure and Realignment Act requires the implementing actions to conform to the provisions of the National Environmental Policy Act of 1969 (NEPA). However, the Act also modified NEPA to the extent that the environmental analysis need not consider:

- (i) the need for closing or realigning a military installation selected for closure or realignment by the Commission;
- (ii) the need for transferring functions to another military installation which has been selected as the receiving installation; or
- (iii) alternative military installations to those selected.

Therefore, although the Air Force is not required to consider alternatives to the relocation of the Weather Training Division to Keesler AFB, consideration must be given to alternatives for the location of the facilities within Keesler AFB. Alternative sites were considered prior to selection of the current sites. Since the topography at Keesler AFB is uniform, facilities are sited primarily in regard to compatibility with existing structures and operations in the vicinity. The final site selection for the Weather Training Facility was based on functional considerations, i.e., close to the housing area for students. The final area has been selected for location of the NEXRAD antenna; however, the specific site within the area remains to be determined. The Civil Engineering Division reviewed all possible site areas for the NEXRAD radar antenna and all possible sites for the Weather Training Facility, and recommended sites to the Base Commander. The final sites were also reviewed and approved by the Facilities Planning Board. Since the final sites (area for NEXRAD) have already been determined, alternatives to these sites will not be discussed.

As stated in Section 1-1, on December 29, 1988, the Commission recommended the realignment and closure of 145 military installations. On

January 5, 1989, the Secretary of Defense approved those recommendations and announced that the Department of Defense would implement them. The Congress did not pass a Joint Resolution disapproving the recommendations within the time allotted by the Act. Therefore, the Act now requires the Secretary of Defense, as a matter of law, to implement those closures and realignments. Implementation must be initiated by September 30, 1991, and must be completed no later than September 30, 1995.

The Air Force will begin to close Chanute AFB beginning in 1990. The Weather Training Division will be relocated to Keesler AFB, thereby expanding the mission of Keesler AFB. Construction of the Weather Training Facility at Keesler AFB is scheduled to begin in FY 90. Current plans are to have the last classes taught at Chanute AFB to begin during May 1992 and the first classes taught at Keesler AFB to begin in July 1992. Since the length of the classes varies from 12 to 114 days, allowances must be made for relocation of equipment from Chanute AFB to Keesler AFB following completion of the classes for which it is needed (unless new equipment will be available at the Keesler AFB facility). If base closure and realignment are to be implemented by September 30, 1995, deviations from this schedule must be minimal.

## **2.2 DESCRIPTION OF THE ACTION**

The action addressed in this EA is the relocation of the Weather Training Division and the reallocation of personnel authorizations from Chanute AFB (Rantoul, Illinois) to Keesler AFB (Biloxi, Mississippi) as part of the Secretary of Defense's decision regarding base realignments and closures. This is an administrative action in the interest of operational efficiency and mission consolidation of military installations.

Chanute AFB is located in Rantoul (Champaign County), Illinois, approximately 12 miles north of Champaign-Urbana and 120 miles south of Chicago. The 3350th Technical Training Group at Chanute AFB offers turboprop

and jet engine maintenance, maintenance management, as well as weather observation, forecasting, and weather equipment repair. The Weather Training Division at Chanute AFB develops, maintains, and conducts resident, mobile training team, and career development course training in weather observation, forecasting, and advanced meteorology for all DOD agencies. The Weather Training Division currently has four courses with a total of 125 classes per year and trains 1,792 students per year. The Air Force will begin to close Chanute AFB beginning in 1990. The Weather Training Division will be relocated to Keesler AFB, thereby expanding the mission of Keesler AFB. Current plans are to have the last classes taught at Chanute AFB to begin during May 1992 and the first classes taught at Keesler AFB to begin in July 1992. Equipment currently located at Chanute AFB is to be moved to Keesler AFB following completion of the class for which it is used.

Relocation of the Weather Training Division to Keesler AFB will include the reallocation of personnel authorizations from Chanute AFB to Keesler AFB. The number of permanent party military personnel and civilian employees to be assigned to Keesler AFB in connection with the Weather Training Facility include an estimated 20 officers, 158 enlisted personnel, and 65 civilians, totalling 243. Student loadings are projected to average about 476 daily, with approximately 10 to 12 officers. The length of stay averages 55 days for TATB (Weather Technician Course), 114 days for TATC (Advanced Airman Forecaster Course), 12 days for TATD (Advanced Weather Officer Course), and 25 days for two 2AZR (Navy Oceanographic Courses). The total increase in population to the area including permanent personnel, students, and dependents is projected to average 1,258 persons at any given time.

The NEXRAD system is part of the equipment to be installed in the new Weather Training Facility. NEXRAD is a computer-based weather radar system which can estimate the velocity of objects through the application of the Doppler principle. Detection of hazardous weather phenomena, such as tornadoes, severe thunderstorms, heavy precipitation, hail,

high winds, and severe turbulence are part of the system's capabilities. The NEXRAD system to be located at Keesler AFB will transmit a pencil beam from an antenna at a frequency of 2,870 megahertz or, when necessary, an alternative frequency of 2,880 megahertz (Morton 1989). NEXRAD will utilize at least three pulse-repetition frequencies between 500 and 1,200 pulses per second (USDOC 1984). Current plans call for installation of 16 computer terminals in the Weather Training Facility initially with expansion to 24 terminals.

In 1984, the NEXRAD Joint System Program Office released a NEXRAD Programmatic Environmental Impact Statement (USDOC 1984). This document describes the probable environmental impacts of constructing and operating the NEXRAD system which will consist of approximately 145 radar units distributed across the United States. The document addresses potential impacts from radio frequency radiation and electromagnetic interference, impacts on human health and biological systems, and effects on pacemakers, electroexplosive devices, and fuel handling. The impact analysis indicates that construction and operation of the NEXRAD system will have no significant adverse environmental impacts. All anticipated impacts are or can be limited to minor local effects.

Specific projects (see Figures 2-1 and 2-2 for locations) associated with the relocation of the Weather Training Division include:

1. Construction of a new 83,700-square-foot Weather Training Facility. As currently projected (USAF 1989a), the new facility will be a 2-story structural steel and masonry building with concrete footings and floors, masonry walls, storm-resisting roof systems, and an observation deck. The facility will include administrative, academic, and laboratory areas to provide instruction and laboratory training in all aspects of weather theory, instrumentation, and equipment maintenance. The facility will be designed in an architectural style compatible with existing buildings constructed on Keesler AFB since 1972.

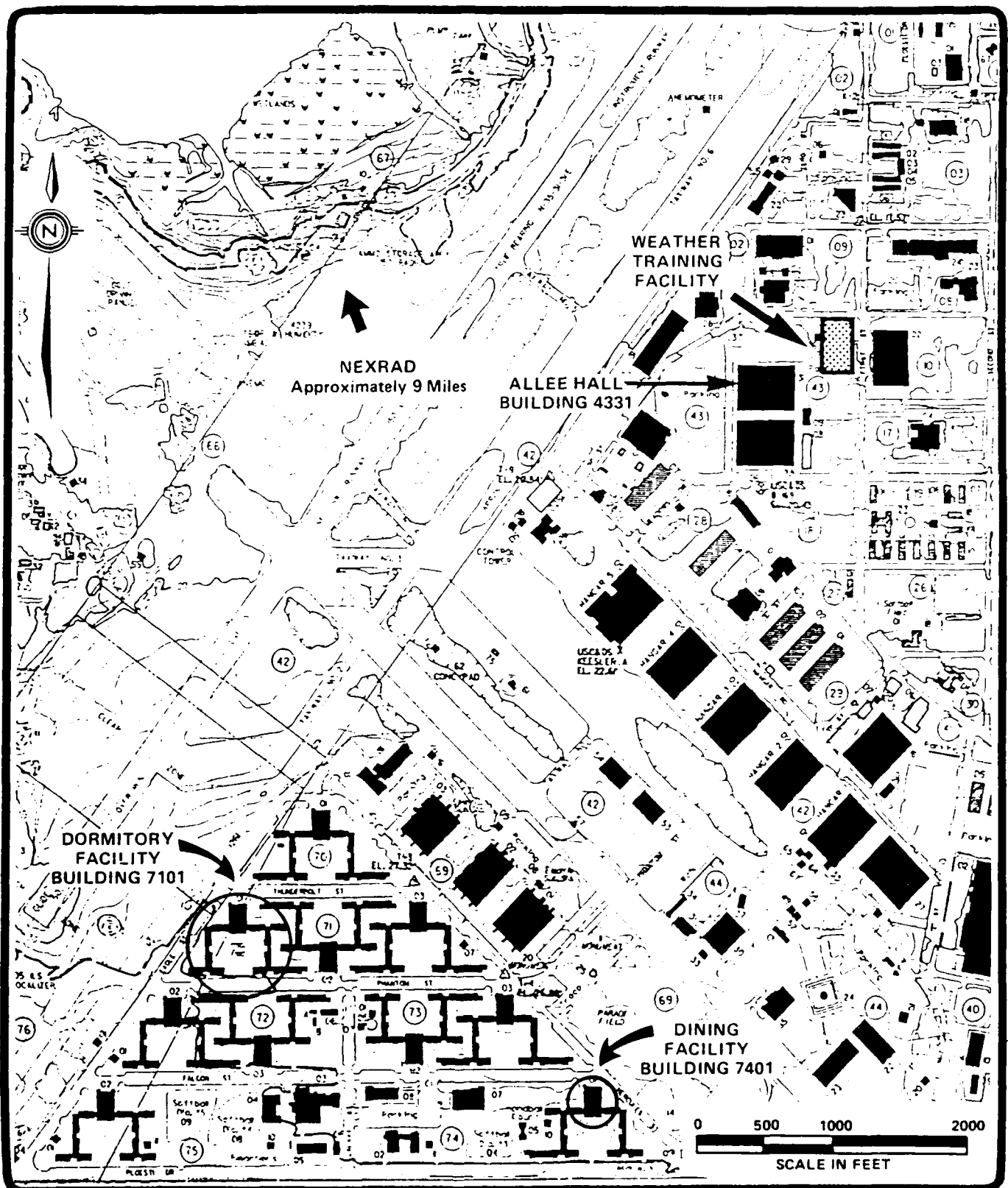
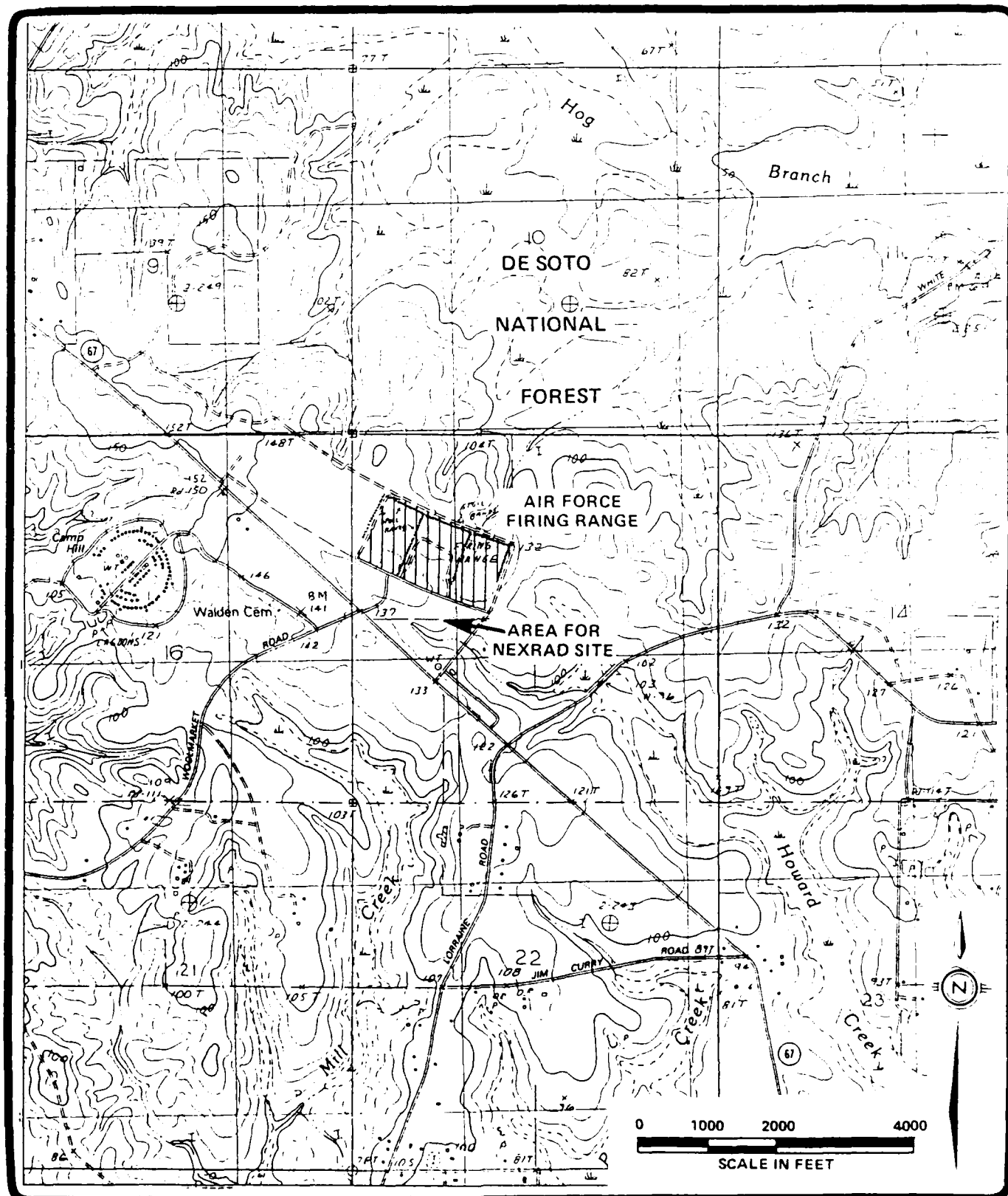


FIGURE 2-1. Project Sites Associated with the Relocation of the Weather Training Division to Keesler AFB

SOURCE: Mid States Engineering Inc. 1987.  
WAR 1989.

ENVIRONMENTAL ASSESSMENT OF THE  
RELOCATION OF A WEATHER TRAINING  
FACILITY TO KEESLER AIR FORCE BASE,  
BILOXI, MISSISSIPPI



**FIGURE 2–2. Proposed Area for the NEXRAD Radar Antenna Site**

**SOURCE: USGS 1982.**

# ENVIRONMENTAL ASSESSMENT OF THE RELOCATION OF A WEATHER TRAINING FACILITY TO KEESLER AIR FORCE BASE BILOXI, MISSISSIPPI

2. Construction of an antenna field associated with the Weather Training Facility. The antenna field will be located immediately to the west of the Weather Training Facility and occupy approximately 1.25 to 1.5 acres. The actual configuration will be determined during completion of the final design process for the Weather Training Facility. Several live oaks are present in the vicinity of the Weather Training Facility site but are not within the footprint of the building and will not be removed or damaged during construction of the facility or associated antenna field.
3. Construction and installation of the NEXRAD radar antenna associated with the Weather Training Facility. Physically, the radar antenna will be enclosed in a nearly spherical radome about 35 feet in diameter mounted on a tower. The antenna will be located approximately 9 miles northwest of Keesler AFB on military property in the De Soto National Forest (Figure 2-2). The proposed area for the site is southwest of the U.S. Air Force firing range and located between the firing range and Highway 67 in a natural stand of pine trees. The site is near the headwaters of Howard Creek. An area approximately 100 feet by 100 feet will be cleared and fenced. Within this area, a concrete pad will be located upon which the NEXRAD radar dome will be placed. The pad will be approximately 25 feet by 25 feet.
4. Demolition of two existing buildings (4304 and 4336) within the proposed footprint of the Weather Training Facility. Building 4304 is a Housing Support and Storage Facility which was built in 1941. It is of wood frame construction and has been declared obsolete. Building 4304 contains asbestos in pipe insulation, in the vicinity of the boiler, and in the exterior siding (asbestos shingle siding). Removal of the asbestos will be in compliance with state and federal regulations. Building

4336 is a storage shed for use by the Fire Department. Built in 1984, it is 140 square feet in size and does not contain asbestos.

5. Renovation work to alter an existing training facility. Originally, alterations to three existing training facilities were included in base closure actions. However, only Allee Hall (Building 4331) remains in the current plans. Work to be completed is minimal and includes painting, fix-up, and installation of new light fixtures.
6. Renovation of Dorm 7101 and the Dining Hall in 7401 which were scheduled as part of the base closure action. Students at the Weather Training Facility may or may not live or eat at these two buildings in the Triangle Housing area. There are 10 buildings in this area, 4 of which have dining facilities. Renovations to the dining halls and dormitories is a continuing process and actual assignments of students to the various buildings is dependent upon their schedules. The work to be completed (USAF 1989b) in Dorm 7101 includes replacing deteriorated mirrors, shelving, light fixtures, bedroom wardrobes, doors and frames, smoke detectors, floor coverings, and stair treads. Existing open ceilings will be covered with gypsum-board, and concrete floors which have settled will be repaired. Building 7401 is also a dormitory, but only the dining hall portion of it is being renovated as part of base closure actions. Renovations to the dining hall include: paint the entire kitchen; install new refrigeration units; extend the duct work and vents in the kitchen area to improve cooling; replace floor tile; replace light fixtures; replace exhaust hoods in the kitchen, serving line, and dishwashing areas; replace serving line equipment; install carpet, room dividers, and new seating in dining areas; and make necessary roof repairs.

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Project cost estimates for the renovations to the dormitory and the dining hall total \$1.5 million. The project cost estimates for construction of the Weather Training Facility, antenna field, NEXRAD radar antenna, alterations to Building 4331, and demolition of Buildings 4304 and 4336 total \$8.6 million.

This EA is being prepared to determine what environmental and socioeconomic impacts these actions will have on Keesler AFB and the Biloxi area.

### **3.0 EXISTING ENVIRONMENT**

Keesler AFB is located within the city limits of Biloxi, Mississippi, approximately halfway between New Orleans, Louisiana and Mobile, Alabama. Located on land donated by the City of Biloxi in 1941, Keesler AFB has been a dominant presence on the Gulf Coast. The base is bordered (see Figures 1-1 and 2-1) on the east, west, and south by residential and commercial areas and on the north by the Back Bay of Biloxi. The base is approximately 0.5 mile north of Mississippi Sound.

The main base comprises 1,494 acres of land under federal jurisdiction, and another 117 acres of contiguous land which is leased, in permitted use, or in easements. Training Annex No. 1 consists of 57 acres of federal land about 2 miles west of the main base and includes housing and recreational facilities. The Small Arms Range Annex is a 1,877-acre reserve in north-central Harrison County which includes 10 acres of federal land, with the remainder under permits for federal use.

Keesler AFB has three flying missions: the 7th Airborne Command and Control Squadron, 53rd Weather Reconnaissance Squadron, and 403rd Tactical Airlift Wing. Keesler AFB is known as the largest electronics and computer training center of the Air Training Command. The military personnel are trained in administration, communications, electronics, avionics, and air traffic control. Keesler AFB is currently the home of the Keesler Technical Training Center, the 3300 Technical Training Wing, 3380 Air Base Group, USAF Hospital-Keesler, and other smaller DOD units. Keesler AFB consists of approximately 4,600 active military personnel and 750 reservists. There are approximately 4,500 civilian employees. It has an average daily student load of approximately 3,800 and a total active base population of approximately 9,900.

The existing environment in the vicinity of the construction/renovation sites will be described in order to permit determinations of what effects the action will have on the area.

### 3.1 PHYSICAL AND BIOLOGICAL RESOURCES

#### 3.1.1 Physiography and Topography

The Gulf Coastal area has been sinking for millions of years, forming a geosyncline, which has been described as a "vast, sinking trough" (Newcome, et al. 1968). This geosyncline is an early Cenozoic structural basin, and streams draining into the Gulf have, for more than 60 million years, kept the trough nearly full of mud, sand, and gravel deposits. As a result, the Mississippi Gulf Coast is underlain by deltaic and estuarine sediments, consisting primarily of clay, silt, and sand. Over time, these sediments have accumulated in a narrow band along Mississippi Sound to a depth which probably exceeds 30,000 feet (SOUTHNAVFA-CENGCOM 1986b; Newcome, et al. 1968).

Keesler AFB and the surrounding area are located within the Coastal Lowlands Subdivision of the Eastern Gulf Coastal Plain (USACOE 1984b). Topography is generally rolling to flat, but in the northernmost part of the Coastal Plain, elevations can reach 700 feet above sea level (SOUTHNAVFA-CENGCOM 1986a). The Coastal Lowlands are flat and locally swampy, with a shoreline consisting of drowned river valleys. Tidewater creeks and rivers characterize the coastline, and tidal marshes can reach a width of up to 10 miles.

Keesler AFB is located on a peninsula dividing Back Bay of Biloxi and Mississippi Sound. This peninsula is 1.5 miles wide and extends eastward for approximately 8 miles. The northern border of Keesler AFB is the Back Bay of Biloxi which is characterized by salt marshes and tidal mud flats with elevations of less than 5 feet above mean sea level (msl). There is little relief on the base. The maximum elevation is slightly more than 30 feet msl at the golf course, east of the airfield. The majority of the base has an elevation of approximately 20 feet msl. The elevation of the proposed site for the new Weather Training Facility is approximately 20 feet msl with very little relief (USGS 1954). The elevation at the proposed NEXRAD radar antenna site is approximately 100 feet msl.

Data on soils in Harrison County are available in the Soil Survey of Harrison County, Mississippi (Smith 1975). Keesler AFB is located within the band of Eustis-Lakeland-Latonia soils. Most of the base, including the proposed site for the Weather Training Facility, is characterized as Eustis loamy sand (EtB) with a slight (0 to 5 percent) slope. This is a somewhat excessively drained soil with little or no runoff. Permeability is moderately rapid and the available water capacity is low. The proposed site for the NEXRAD radar antenna is northwest of Keesler AFB in the De Soto National Forest. The soils in this area are Ruston fine, sandy loam (RuB and RuC) and the slope ranges from 2 to 8 percent. These soils have slight to moderate erosion potential, moderate permeability, and medium to high water capacity. Soil blowing is a potential hazard at both of these sites if the soil is left bare and unprotected in dry periods. However, proper erosion control techniques during construction will prevent significant negative impacts on the local soils.

### **3.1.2 Regional Weather Patterns**

The Mississippi Gulf Coast has a subtropical climate, characterized by hot, humid summers and short winters. The average annual rainfall at Keesler AFB is 60.7 inches based on records covering a 44-year period. Mean rainfall ranges from 6.8 inches in July to 2.7 inches in October. Thunderstorms are common in the summer months, and fog occurs frequently during the winter months. The average relative humidity at Keesler AFB is 80 percent at 6:00 a.m. Central Standard Time (CST), decreasing to 63 percent at noon CST (AWS 1986). The mean temperature at Keesler AFB ranges from 52°F in January to 83°F in July and August. The maximum recorded temperature was 104°F while the lowest temperature recorded on the base was 10°F.

The average date of the first freeze is December 12, and the average date of the last freeze is February 21 (SOUTH DIV NAVFAC ENG COM 1986a). For the period 1942-1986, there were an average of 11 days per year with

temperatures below 32°F and 48 days with temperatures above 90°F. Snow has been reported several times (always between September and March) with a maximum of 6 inches reported in a 24-hour period (AWS 1986).

The prevailing winds are generally from a southerly direction during the summer months. During late fall and early winter, winds shift to the north, due to the influence of continental air masses. Mean wind speeds average 4 to 6 knots at Keesler AFB. The highest recorded wind speed is 112 knots (SOUTHDIVNAVFACENGCOM 1986b, AWS 1986).

Late summer/early fall hurricanes occur frequently along the Gulf Coast during the hurricane season which extends from June through October. Most storms occur in September (44 percent), August (15 percent), and October (15 percent). The probability of a tropical storm making land-fall between Biloxi and Mobile Bay in a given year has been calculated at 13 percent, that of a hurricane at 6 percent, and that of a severe hurricane at 1 percent. The short Mississippi coastline is actually only crossed by an average of 19 tropical storms per century, with 8 of these being hurricanes.

Tornadoes are reported infrequently along the Mississippi Gulf Coast. Because tornadoes tend to move from the southwest, any tornado affecting Keesler AFB would probably come from the direction of Mississippi Sound, where they do not develop readily. Waterspouts, however, have been reported and could cause damage upon moving inland (Bisso, et al. 1979).

### **3.1.3 Natural Hazards**

The Mississippi Gulf Coast lies in Zone 2 of the U.S. Coast and Geodetic Survey's scale of 0 to 3 in ranking the possibility of damage from earthquakes. However, an earthquake is unlikely to occur in this region because it is located in an inactive seismic zone. In other words, in the unlikely event that an earthquake occurred, damage would most likely be moderate. There are regular tremors in Louisiana, and the possibility exists that powerful, low-frequency tremors from Louisiana or other

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nearby territories could cause damage to the Mississippi Gulf Coast area (SOUTHDIIVNAVFACENGCOM 1986a).

As described in Section 3.1.2, hurricanes and tropical storms occur frequently along the Gulf Coast. Hurricanes which move inland from the Gulf of Mexico can cause severe damage to coastal communities. Damage from hurricanes is usually associated with high winds, high tides, or heavy rains. Since the winds are usually most severe in the northeast quadrant of a hurricane, hurricanes which strike the southeast coast of Louisiana can force high seas across Mississippi Sound. These storms can be as damaging as those which directly strike the Mississippi coastline (SOUTHDIIVNAVFACENGCOM 1986b).

The Biloxi area has been affected by several hurricanes during this century, including the major storms of 1909, 1915, 1947, 1965, 1969 (Camille), and 1979 (Frederic). In recent years, Biloxi has been affected by hurricanes Bob, Danny, Elena, and Juan in 1985 (NOAA 1986) and Florence in 1988. The Mississippi Gulf coast was not affected by any hurricanes during 1989 (NOAA 1989). Wind speeds during the 1906 and 1916 storms and Hurricane Frederic were greater than 100 mph. The most devastating hurricane to strike the Mississippi Gulf Coast, Hurricane Camille, made landfall near Biloxi, in the Bay St. Louis-Waveland area. Wind speeds exceeded 200 mph and tidal elevations ranged from 24.2 feet in Bay St. Louis (Eleuterius and Beaugez 1979), to 16 feet at Biloxi (USACOE 1984a), 20.1 feet in Gulfport, and 11.2 feet in Pascagoula (SOUTHDIIVNAVFACENGCOM 1986a). Normal tides average about 1.5 feet.

Keesler AFB was not flooded during Hurricane Camille in 1969. A railroad near the south side of the base acted as a natural berm protecting the base (Rackard 1989). Since the storm surge during Hurricane Camille was the highest on record to strike the United States mainland, it is reasonable to assume that although Keesler AFB could sustain major wind damage during a future hurricane, it is unlikely to be flooded by the storm surge of such a hurricane.

#### 3.1.4 Surface Water

The waters of the State of Mississippi are divided into nine major basins (MBPC 1988). Keesler AFB is located within the Coastal Streams Basin. Mississippi Sound, Biloxi Bay, and St. Louis Bay are the major surface water features in the area. The area encompassing Keesler AFB and Biloxi drains into Mississippi Sound directly through the Biloxi and Tchoutacabouffa Rivers and their tributaries via Biloxi Bay. Salinities within Mississippi Sound range from 1 to 29 parts per thousand (ppt) and are inversely related to river flows into the Sound. Salinities in the Gulf of Mexico range from 29 to 35 ppt (Eleuterius and Beaugez 1979).

Fecal coliform levels have been a concern in Mississippi Sound in the past, due to improperly treated wastewater and urban runoff. The MBPC and the Mississippi Department of Health conduct weekly bacterial studies each summer in swimming areas along the Mississippi Gulf Coast. No closures of bathing areas or surface water drinking supplies, and no incidences of waterborne disease were reported in 1988 (MBPC 1988). Improvements in wastewater treatment are cited for the downward trend in fecal coliform levels in Mississippi Sound over the past decade.

Keesler does not have any National Pollutant Discharge Elimination System (NPDES) permits for discharges. The State has declared that Keesler AFB does not need any NPDES permits. Stormwater from the base goes into Back Bay of Biloxi. Sewage is pumped off-base to a regional treatment facility. However, the lift station on-base is operating near or at capacity and overflows during heavy rainfalls. The overflow runs into a roadside drainage ditch which empties into Back Bay of Biloxi. The lift station has 3 pumps and is capable of pumping 5.04 million gallons per day (mgd) with a static holding capacity of 100,000 gallons. The lift station is restricted by the 18-inch main pipeline connecting it to the regional facility. The size of this line only permits 2 of the 3 pumps to operate at any one time. The base will conduct a total collection system survey in FY 90 to determine the needs of the base and modifications necessary.

Very few bodies of fresh water are present on Keesler AFB and none are present at the proposed site for the Weather Training Facility. However, the area selected for the proposed site of the NEXRAD radar antenna is near the headwaters of Howard Creek.

### **3.1.5 Groundwater**

The sediments of coastal Mississippi, which have been deposited since the Miocene period, dip southwest as a result of the Gulf Coast Geosyncline. The water-bearing properties of these geologic units have been exploited since the late 19th century, when the first deep wells in the area were drilled (SOUTHDIIVNAVFACENGCOM 1986b). The Miocene and Pliocene sediments are, in order of descending age, Catahoula Sandstone, Hattiesburg Formation, Pascagoula Formation, Graham Ferry Formation, and the Citronelle Formation. The Citronelle Formation is the youngest and most extensive of the Pliocene and Miocene sediments. Aquifers within the Citronelle Formation, however, are disjunct and hydrologically independent (SOUTHDIIVNAVFACENGCOM 1986a; Sumner, et al. 1987).

The Graham Ferry Formation, located beneath the Citronelle Formation, is the source of most of the fresh groundwater used in the Gulf Coast area (Colson and Boswell 1985; SOUTHDIIVNAVFACENGCOM 1986a). Keesler AFB obtains its potable water supply from the Graham Ferry Formation by 12 deep water wells. Average daily pumping rates during the past year varied from 2.56 MGD in December 1988 to 4.15 MGD in August 1989. No surface water resources are used for potable water for the base.

### **3.1.6 Air Quality**

Biloxi is in the Mobile-Pensacola-Panama City-Southern Mississippi Interstate (Alabama-Florida-Mississippi) Air Quality Control Region. The 1988 Air Quality Report was not available, but Mississippi was reported (Simmons 1989) to be in attainment for all federal and state standards. Table 3-1 lists the national ambient air quality standards compared to 1987 levels for Gulf Coast stations.

Table 3-1. Comparison of Gulf Coast Air Quality to National Ambient Air Quality Standards

Pollutant	Time Frame	Primary Standards	Secondary Standards	Measured Levels at Gulf Coast Stations
PM <sub>10</sub> *	Annual (arithmetic mean)†	50 ug/m <sup>3</sup>		Not tested
	24-hour max.	150 ug/m <sup>3</sup> **		
Sulfur Oxides	Annual (arithmetic mean)†	0.03 ppm††		Below standard
	24-hour max.	0.14 ppm**		
	3-hour max.		0.5 ppm**	
Carbon Monoxide	8-hour max.	9 ppm**		Not tested
	1-hour max.	35 ppm**		Below standard
Ozone	1-hour max.	0.12 ppm***		Not tested
Nitrogen Dioxide	Annual (arithmetic mean)†	0.053 ppm		
Lead	Quarterly (arithmetic mean)†	1.5 ug/m <sup>3</sup>		Not tested

\*Particulate matter less than 10 microns in diameter.

†Arithmetic mean is a measure of central tendency found by summing data collected in a given period and dividing by number of observations in same period.

\*\*Not to be exceeded more than once per year.

††Parts per million.

\*\*\*To be exceeded no more than one day per year based upon a 3-year average.

Source: MBPC 1987.

The Biloxi area, including Keesler AFB, is principally affected by gaseous and particulate emissions from industrial and manufacturing sources. Vehicular sources also contribute to contaminant emissions. Sources of emissions listed in the State of Mississippi Enforcement Management System (Simmons 1989) are identified as major or minor. Major sources are defined as those which produce 100 tons/year. No major sources are listed in Biloxi or the neighboring city of Ocean Springs. Gulfport lists several major sources, including Necaise Construction Company, Inc., Williams Paving Company, Mississippi Power Company (J. Watson Plant), Indal Aluminum, Bond Paving Company, Inc., and Reichhold Chemical Corporation.

Standards for fine particulate air quality were revised in mid-1987. The new standard is based on a unit known as PM<sub>10</sub>, the concentration of particles less than 10 microns, measured in micrograms per cubic meter. The previous standard for particulate air quality, total suspended particulates (TSP), is now used as a surrogate measure of air quality. Used in this role, no TSP monitors operated by the MBPC detected particulate levels approaching the PM<sub>10</sub> standard or the former TSP standard. Three TSP monitors were operated on the Gulf Coast, two in Gulfport and one in Pascagoula. The only PM<sub>10</sub> monitor in Mississippi is located in Jackson and is in compliance with EPA standards (MBPC 1987).

Keesler AFB has three flying missions: the 7th Airborne Command and Control Squadron, the 53rd Weather Reconnaissance Squadron, and the 403rd Tactical Airlift Wing. The primary aircraft in use at the base is the C-130. Impact of these missions on air quality emissions based on the Air Pollution Emissions Inventory for 1988-1989 (Hase 1989) are as follows (tons/year):

<u>Parameter</u>	<u>Internal Combustion Engines</u>		<u>Ground Support Equipment</u>	
	<u>While Flying</u>	<u>While on Ground</u>	<u>JP4</u>	<u>MOGAS</u>
CO	26.4	17.53	2.65	7.78
Hydrocarbons	4.03	1.99	0.834	0.288

Nitrogen Oxide	0.396	0.68	12.19	0.19
Sulfur Oxides	0.23	0.29	0.16	0.01
Particulates	0.0015	0.0043	0.87	0.012

Only the main boiler plant (which has three natural gas burners and produces steam) at Keesler AFB is permitted by the State. The other boilers on-base are not presently permitted but air emission permits are being applied for. The medical center and the clinical lab incinerators are both State-permitted.

### 3.1.7 Noise

Noise is generally defined as unwanted sound. This definition implies a subjective judgement regarding whether a sound is noisy relative to the surrounding environment. Thus, the setting in which a sound is heard plays a large role in whether it is perceived as acceptable. For example, sounds which are not considered disruptive during daytime hours may be intrusive during the quieter nighttime hours. When measuring sound, this distinction is taken into account by the use of a descriptor known as the day night average sound level system (abbreviated DNL and symbolized mathematically by  $L_{dn}$ ). The DNL is expressed in A-weighted decibels (dBA), a system of noise measurement which is progressively less sensitive to sounds of frequencies lower than 1,000 hertz (Hz), as is the human ear. The DNL is the 24-hour average sound level obtained after the addition of a 10-dBA penalty for sound levels which occur at night between 10:00 p.m. and 7:00 a.m. The DNL system has been adopted by EPA, DOD, and the Department of Housing and Urban Development (HUD) for the description of environmental impacts for airport actions (HUD 1985).

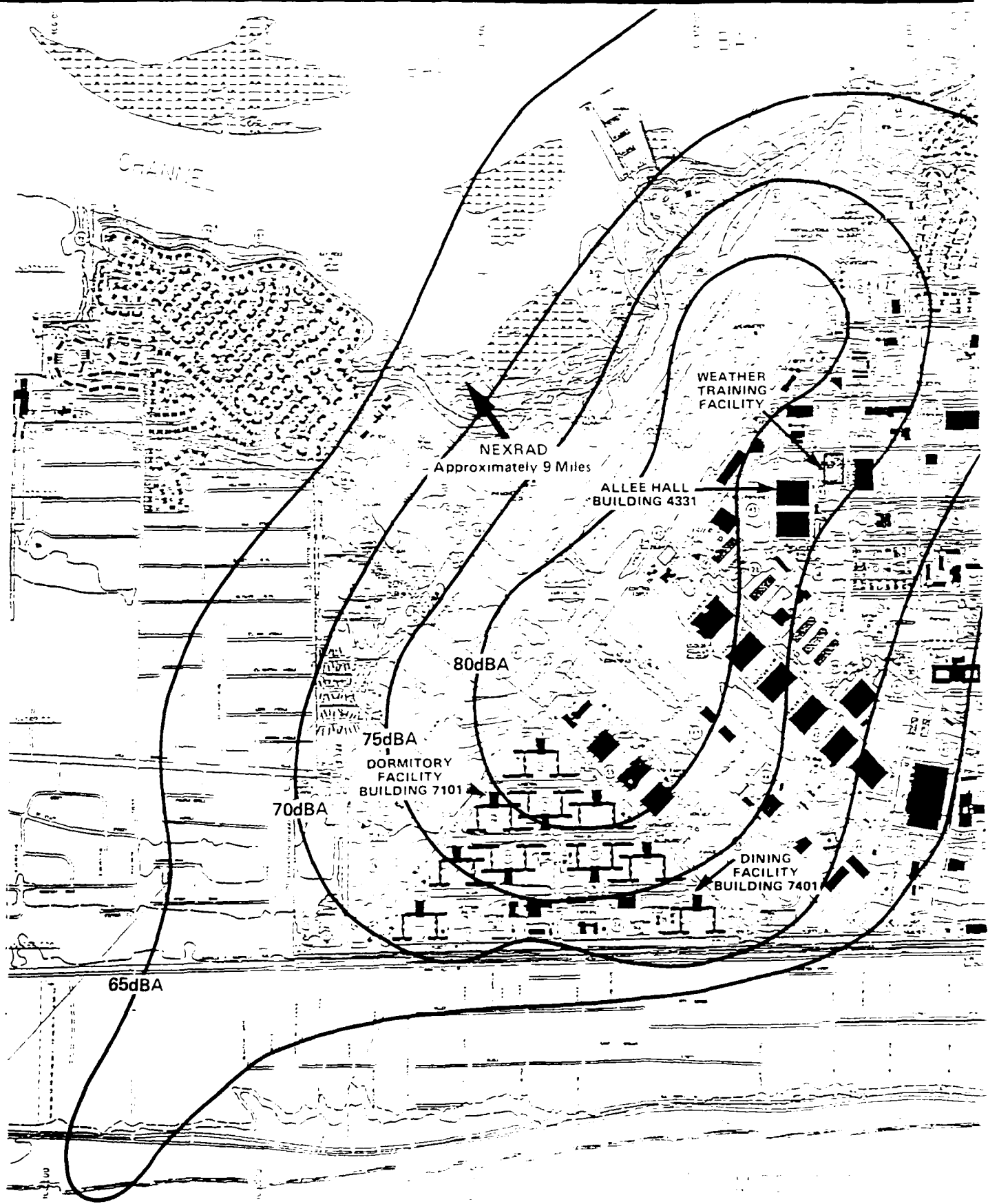
Most military airfields have Air Installation Compatible Use Zone (AICUZ) programs. The AICUZ program is a DOD concept to promote compatible land use in non-government areas around military airfields. The purpose of the program is to minimize the effects of flying operations on land areas adjacent to the installations, to prevent incompatible

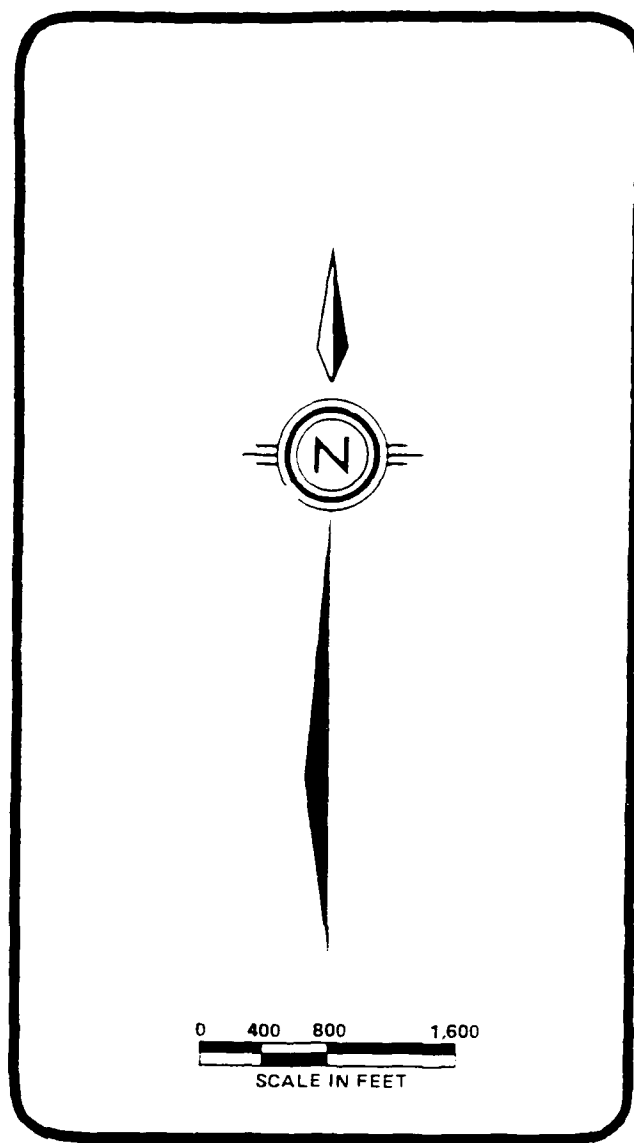
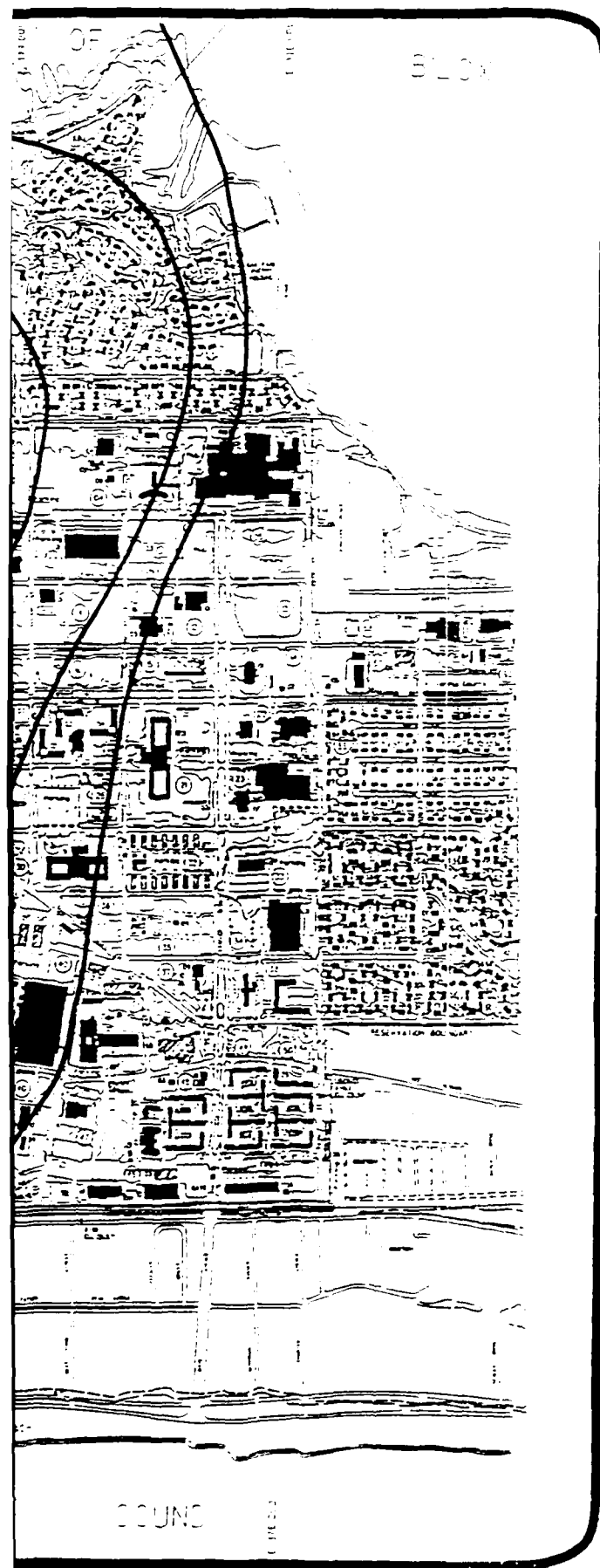
development in high noise exposure and accident potential areas, and to maintain operational capability through compatible land use planning and control. Determination of noise contours for the installations are based on the number of flights, runway utilization, flight time of day, type of aircraft, and flight paths (USAF/LEEV and AFESC/DEV 1984).

Noise contours depicting DNL noise levels near the proposed location for the Weather Training Facility and near the current locations of the dormitory and dining hall slated for renovation are illustrated in Figure 3-1. These locations are within 2,000 feet of an active runway. The noise levels experienced at the sites are high [approximately 73 dBA at the dining hall in Building 7401, 77 dBA at the proposed location of the Weather Training Facility, and 78 to 79 dBA at the dormitory (Building 7101) location]. Noise levels above 75 dBA are generally considered incompatible with classroom and residential uses. However, Keesler AFB was granted an annually renewable waiver from the requirement to publish an AICUZ study and acquire Expanded Clear Zone real property interests (Hase 1989). The waiver is based on the level of operations, type of aircraft at the base, nature of the operations, and noise levels present. In addition, the area has already been built up around the base with little or no developable land available.

Limited available land on the base makes relocation of facilities on the basis of noise levels unfeasible. By this rationale, rather than attempt to find alternative sites for the new and renovated facilities, the preferred action would be to incorporate noise reduction techniques into building construction. These factors will be taken into consideration during completion of the final design and renovation planning for facilities to be constructed or renovated as part of this action.

The NEXRAD radar antenna is to be located on military property in the De Soto National Forest just southwest of the firing range. The nearby state highway (Highway 67) would be expected to generate low noise levels in addition to the noise generated from the firing range when it is





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FIGURE 3-1. Noise Contours (DNL) at Keesler  
AFB

SOURCE USAF 1987b and c.  
WAR 1989.

in active use. However, since it is only the radar antenna which will be located at this site and all personnel utilizing it will be in the Weather Training Facility, the effects of noise at this site are not significant.

### 3.1.8 Vegetation

The Keesler AFB/Biloxi area is located in the Coastal Pine Meadows region. This is a low-lying region of slight relief. Groundwater lies near the surface and forms marshes and swamps. The streams which flow through this region are sluggish and sinuous with sandy bottoms and clear, amber-colored, peaty water (Lowe 1921).

Coastal Mississippi is one of the most interesting regions in the state because of the variety of plants present, and this region possesses more species unique to the area than any other. Within the region, sandy beaches, coastal dunes, brackish marshes, lakes, streams, and upland areas are found. Upland forests of the region consist of longleaf pine-oak, moist pineland, dune, and maritime strand associations. In many cases, pine plantations have replaced the natural upland vegetation communities.

Smith (1975) reported that a total of 285,600 acres (76 percent) of Harrison County is covered by longleaf-slash pine forest (64 percent), loblolly-shortleaf pine forest (7 percent), oak-pine forest (16 percent), oak-hickory forest (4 percent), and oak-gum-cypress forest (9 percent). Although trees of the dominant forest types occur throughout the city of Biloxi, undisturbed forested areas do not exist within the city (Bisso, et al. 1979).

Prior to development, the Keesler AFB area was an upland pine-oak vegetational association. Trees on-base are currently primarily live oak and slash pine. Numerous species and varieties of nursery-grown trees, shrubs, and grasses planted on the base are listed in the Keesler AFB

Land Management Plan (USAF 1988). Ground cover on the base consists primarily of bermuda grass, centipede grass, and St. Augustine grass.

As described in Section 2-2, the proposed site of the Weather Training Facility on Keesler AFB is presently occupied by paved parking areas, areas of herbaceous vegetation/exposed soil, and two buildings which will be demolished. In addition, several live oaks are present in the vicinity of the site, but not within the footprint of the building. The live oaks will not be destroyed or damaged during construction of the Weather Training Facility. The proposed site for the NEXRAD radar antenna is located in the De Soto National Forest near the U.S. Air Force firing range. The site is near the headwaters of Howard Creek in a partially cleared pine forest area southwest of the firing range.

The Weather Training Facility, NEXRAD radar installation, and Dormitory/Dining Hall renovation sites are all located in upland areas. Except for the NEXRAD radar site which is located near the headwaters of Howard Creek, there are no freshwater or marine habitats present at any of these sites. Therefore, it is highly unlikely that freshwater or marine resources will be impacted.

### 3.1.9 Wildlife

Because of the diversity of habitats in the Gulf coastal region, a considerable diversity of wildlife is also found in the area. The raccoon (Procyon lotor varius) and the opossum (Didelphis marsupialis) are among the most common mammals along the Mississippi coast. The rice rat (Oryzomys palustris palustris) commonly occurs in salt marshes, feeding on the abundant grass and sedge seeds. Although the cotton rat (Sigmodon hispidus hispidus) occasionally feeds in the saltmarshes, it primarily inhabits grassy fields above the shoreline. Introduced exotic species include the house mouse (Mus musculus), black rat (Rattus rattus), Norway rat (Rattus norvegicus), the nine-banded armadillo (Dasypus novemcinctus), and nutria (Myocastor coypus). Armadillos usually burrow in dry

sandy areas, whereas nutria inhabit both freshwater and saltwater marshes (O'Neil and Mettee 1982).

Much of Keesler AFB has been developed by construction of buildings or paving of areas for runways or parking. This amount of construction has limited the amount of wildlife found on the base. Coastal mammals possibly found at Keesler AFB are those adapted to urban conditions. These species include the raccoon, rice rat, cotton rat, black rat, Norway rat, and the house mouse. Bird species that commonly occur in urbanized areas such as Keesler AFB include the Northern mockingbird (Mimus polyglottos), House sparrow (Passer domesticus), Brown thrasher (Toxostoma rufum), Cardinal (Cardinalis cardinalis), Blue jay (Cyanocitta cristata), and Mourning dove (Zenaida macroura). Mature live oaks at Keesler AFB were sited by Toups and Jackson (1987) as significant coastal bird habitat. The greatest variety of species is present from August through May.

Since the NEXRAD radar antenna site is located in proximity to a large expanse of forested land in the De Soto National Forest, many wildlife species are likely to inhabit or migrate through the area. However, since the site is also adjacent to the U.S. Air Force firing range, species that are sensitive to human disturbance would not inhabit the area while the firing range was active. Typical species would include the eastern cottontail rabbit, raccoon, armadillo, bobcat, and quail. Arboreal species such as the fence lizard and gray squirrel would also be common.

The marine fauna offshore of Keesler AFB includes mammals, reptiles, finfish, shellfish, and benthic invertebrates. Very little is known of the invertebrate communities in Back Bay of Biloxi. According to Dr. Richard Heard (1989), benthic populations in the vicinity of Keesler AFB are typical oligohaline salt marsh forms. The distribution, ecology, and taxonomy of salt marsh invertebrate assemblages are described by

Heard (1982). However, none of the construction/renovation sites are adjacent to marine waters. It is highly unlikely that any of the marine resources will be affected and, therefore, the marine resources will not be further discussed.

Species of wildlife that are hunted or trapped in the vicinity of Keesler AFB include raccoon, opossum, beaver, muskrat, nutria, and waterfowl. These species are considered a food resource and/or their furs are of some commercial value.

#### **3.1.10 Threatened and Endangered Species**

Although the Mississippi Natural Heritage Program (MNHP) does not provide formal legal protection for plants, special status has been given to the upland and coastal plant species listed in Table 3-2. None of these species are protected under federal legislation. In addition, under the authority of the Mississippi Department of Natural Resources, the MNHP has listed threatened and endangered animals which are protected under MS Statute 49-5-109. These animals are also protected under federal legislation of the Department of the Interior. Table 3-2 also lists the status of state and federally protected animal species which may occur on or near Keesler AFB. Species listed were selected on the basis of species range and presence of suitable habitat. The endangered Atlantic sturgeon (Acipenser oxyrhynchus) is the only protected coastal fish species. The sturgeon is an anadromous species, spending much of its life in the Gulf of Mexico. It also occurs in Mississippi Sound and spawns in the Chickasawhay, Pearl, and Bogue Chitto Rivers. Sturgeon are not known to occur in Back Bay of Biloxi (MDWC 1989).

The MNHP stated in a letter received July 10, 1989 that there were no records of threatened or endangered plant or animal species or critical habitat on Keesler AFB including the construction/renovation sites associated with the relocation of the Weather Training Division to Keesler AFB. In addition, there are no records of threatened or endangered plant or animal species in the area proposed for the NEXRAD

Table 3-2. Threatened and Endangered Species of Coastal Mississippi  
(Page 1 of 2)

Scientific Name	Common Name	Status		Habitat
		State	Federal	
<b>PLANTS</b>				
<u>Canna flaccida</u>	Golden Canna	CI	—	Pine marshes
<u>Conradina canescens</u>	Seaside Balm	CI	--	
<u>Elionurus tripsacoides</u>	Pan American	SU	—	
	Balsam Scale			
<u>Eulophia ecristata</u>	Smooth-lipped	CI	C2	Dry grassy areas
	Eulophia			
<u>Ilex amelanchier</u>	Juneberry Holly	R	C2	Wooded stream banks
<u>Lachnocaulon digynum</u>	Bog Buttons	I	C2	
<u>Lilaeopsis carolinensis</u>	Carolina Lilaeopsis	I	C2	Open mud flats
<u>Magnolia tripetala</u>	Umbrella Tree	CI	--	Rich woods
<u>Pieris phillyreifolia</u>	Climbing Fetterbush	CI	C3	Cypress and Ilex ponds
<u>Pinguicula planifolia</u>	Chapman's	I	C2	Black peat in cypress
	Butterwort			domes
<u>Platanthera integra</u>	Yellow Fringeless	R	C3	
	Orchid			
<u>Rhododendron austrinum</u>	Florida Flame	I	C3	Moist, wooded slopes
	Azalea			
<u>Rhynchospora tracyi</u>	Tracy's Beak Rush	CI	--	Cypress swamps
<u>Ruellia noctiflora</u>	Night-flowering	R	--	
	Ruellia			
<u>Sageretia minutiflora</u>	Tiny-leaved	I	C3	Sand dunes
	Buckthorn			
<u>Sarracenia purpurea</u>	Pitcher Plant	CI	--	Sphagnum bogs
<u>Schwalbea american</u>	Chaffseed	CI	C2	Pine woodlands
<u>Xyris drummondii</u>	Drummond's Yellow-	I	C2	Wet pine barrens
	eyed Grass			
<u>Xyris flabelliformis</u>	Fan-shaped Yellow-	SU	—	Moist savannahs
	eyed Grass			
<u>Xyris scabrifolia</u>	Harper's Yellow-	CI	C2	Wet pine barrens
	eyed Grass			
<b>MAMMALS</b>				
<u>Balaena glacialis</u>	Right whale	E	E	
<u>Balaenoptera borealis</u>	Sei whale	E	E	
<u>Balenoptera physalus</u>	Finback whale	E	E	
<u>Megaptera novaeangliae</u>	Humpback whale	E	E	
<u>Physeter catodon</u>	Sperm whale	E	E	
<u>Trichechus manatus</u>	West Indian Manatee	E	E	

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Table 3-2. Threatened and Endangered Species of Coastal Mississippi  
(Page 2 of 2)

Scientific Name	Common Name	Status		Habitat
		State	Federal	
<b>REPTILES</b>				
<u>Alligator mississippiensis</u>	American alligator	E	E	Marshes
<u>Caretta caretta caretta</u>	Loggerhead turtle	T	T	Tropical and temperate seas and oceans
<u>Chelonia mydas mydas</u>	Green turtle	E	E	Tropical and temperate seas and oceans
<u>Dermochelys coriacea</u>	Leatherback turtle	E	E	Open bay
<u>Eretmochelys imbricata</u>	Hawksbill turtle	E	E	Open bay
<u>imbricata</u>				
<u>Lepidochelys kemp</u>	Atlantic ridley turtle		E	E Open bay
<b>BIRDS</b>				
<u>Charadrius alexandrinus</u>	Snowy Plover	E	C2	Sand flats, beaches
<u>Falco peregrinus</u>	Peregrine Falcon	E	E	Beach
<u>Haliaeetus leucocephalus</u>	Bald Eagle	E	E	Open bay, marshes
<u>Pelecanus occidentalis</u>	Brown Pelican	E	E	Open bay
<u>Sterna antillarum</u>	Least Tern	-	E	Beach, open bay

C2 = Category 2 - Under review for listing, but substantial evidence of biological vulnerability and/or threat is lacking.

C3 = Category 3 - Species is more abundant and/or widespread than previously believed.

T = Threatened

E = Endangered

R = Rare

S = Species of Special Concern

I = Imperiled

CI = Critically Imperiled

SU = Status Uncertain

Source: Mississippi Natural Heritage Program 1989, Mississippi Department of Wildlife Conservation 1989.

antenna site. However, a survey will need to be conducted of the final site selected to verify that none are present (Gordon 1989). Since all of the construction/renovation sites addressed in this document are in upland areas, no impact on protected marine organisms is expected.

### **3.1.11 Unique and Critical Habitats**

Wetlands and open water areas associated with Back Bay of Biloxi are considered to be critical habitat for a large variety of marine animals. Back Bay of Biloxi is an important nursery area for immature finfish and shellfish, providing protection and excellent food resources. In addition, the salt marsh on the northern edge of Keesler AFB is considered critical habitat because, as a portion of the Back Bay estuary, it represents significant wildlife habitat. Wetlands associated with Back Bay of Biloxi are sensitive to perturbation because they have been reduced in size and fragmented by dredge and fill projects, and they receive significant urban stormwater runoff. The salt marsh at Keesler AFB has already been partially filled. Mud flats and marsh areas north of the channel were listed as preservation areas by the MNHP (Gordon 1989).

All of the sites associated with the relocation of the Weather Training Division to Keesler AFB are in upland areas. There are no known unique or critical habitats at any of the proposed sites for the actions addressed in this EA. However, the large, mature oak trees in the vicinity of the proposed site of the Weather Training Facility will be preserved and protected. These trees, along with others on-base, provide foraging, resting, and nesting habitat for a large number of arboreal wildlife species. Because oaks exhibit very slow growth rates, mature oaks practically represent an irreplaceable habitat resource.

## **3.2 SOCIOECONOMIC RESOURCES**

### **3.2.1 Region of Influence**

Keesler AFB is nearly surrounded by the city of Biloxi with the city of Gulfport located to the west. Gulfport, platted in 1885 and incorporated in 1898, is the Harrison County seat and an active commercial port.

Biloxi was established in 1699 by French settlers and is one of the oldest continuously occupied cities in the United States. Biloxi is part of the Biloxi-Gulfport Metropolitan Statistical Area (MSA). The Biloxi-Gulfport MSA includes Harrison, Hancock, and Stone Counties (see Figure 1-1). Jackson County is adjacent to Harrison County on the east side and Hancock County is to the west. Harrison, Hancock, and Jackson Counties form the area known as the Mississippi Gulf Coast, fronting on the Gulf of Mexico. These three counties comprise a land area of nearly 1,800 square miles. More than 16 million people live within a 400-mile radius. The limited extent of the action addressed in this EA will primarily affect Harrison County, with some minor potential for housing and related impacts in Jackson County.

### 3.2.2 Demographics

Resident population in Harrison County, the second most populous county in Mississippi, has increased slowly in recent years. From 1970 to 1980, the total county population grew from 134,582 to 157,665, according to the U.S. Census. The current county population estimate is 169,421. Anticipated population growth of slightly more than 1,000 persons per year will result in a 1994 population of just over 175,000 persons. Table 3-3 illustrates the population estimates for Harrison County, Biloxi, and Gulfport in 1970, 1980, and 1989, with the projected increase to 1994. Biloxi is also expected to continue to gain population at a slow but steady rate. These figures reflect a stable population with balanced migration and natural population increase.

Table 3-4 lists population estimates for Harrison County by age groups. These figures indicate that the county population is aging, reflecting national trends. Residents under age 18 declined from 30.5 percent of the total population in 1980 to 27.6 percent in 1989. Persons in the prime working age group from 25 to 64 years of age increased 6.3 percent while elderly residents also increased slightly in numbers and percentage of total population during this period.

Table 3-3. Population Trends for Harrison County, Biloxi, and Gulfport, Mississippi

Area	1970	1980	1989	1994
Harrison County	134,582	157,665	169,421	175,224
Biloxi	48,486	49,311	51,820	52,675
Gulfport	40,791	39,676	41,390	41,575

Sources: Mississippi Power Company and Urban Decision Systems 1989.  
U.S. Department of Commerce, Bureau of Census 1970, 1980.  
Van Horn Gray Associates 1989.

Table 3-4. Age Distribution of Population in Harrison County,  
Mississippi

Age	1980	Percent	1989	Percent
0-5 years	15,579	9.9	15,813	9.3
6-17 years	32,448	20.6	31,037	18.3
18-24 years	25,965	16.5	20,267	12.0
25-64	70,002	44.4	85,822	50.7
65 + years	<u>13,671</u>	<u>8.7</u>	<u>16,482</u>	<u>9.7</u>
Total	157,665	100.0	169,421	100.0

Sources: Mississippi Power Company and Urban Decision Systems 1989.  
U.S. Census Bureau, Census of Population 1970 and 1980.  
Van Horn Gray Associates 1989.

Personnel assigned to Keesler AFB are a significant component of the population in Harrison County. According to the 1986 Economic Resource Impact Study for the base, 13,305 military personnel were assigned to Keesler AFB. Another 3,446 civilians were employed at the base, as well. Dependents of military personnel were estimated at 15,924, and students attending training at the base averaged 6,132. The population attributable to the base is summarized in Table 3-5. There were also over 7,700 military retirees in the area.

Total base-related population in 1986 is estimated at almost 44,000 persons. This figure includes dependents of civilian personnel estimated at 1.5 persons per civilian employee. Not all base personnel reside in Harrison County, although it is estimated that the number residing out of the county is not significant. With an estimated county population of 165,500 in 1986, it is evident that Keesler AFB supports perhaps 20 to 25 percent of the total county population.

### **3.2.3 Economic Activity**

Prior to World War II, the Mississippi Gulf Coast economy was based primarily on timber, shrimping and other seafood, and tourism. The seafood and tourism industries are still vital sectors of the economy, although forestry products have become less significant. Newer industries along the Mississippi Gulf Coast produce ships, container-handling cranes, chemical products, and scientific optics, among other manufactured products. In Harrison County, the five largest manufacturers in 1986 were DuPont (chemicals), Pass Christian Industries (sportswear), Regina Company (sweepers), Paceco, Inc. (cranes), and Gulf Publishing Company (newspaper). The presence of federal installations is significant. Besides Keesler AFB, Stennis Space Center, Naval Construction Battalion, the Air Force Medical Facility at Keesler AFB, Naval Home Residential Care Facility, and the Veterans Administration Hospital are major generators of economic activity.

Table 3-5. Base-Related Population for Keesler AFB in 1986

Group	Persons
Military, Personnel	13,305
Military, Dependents	15,924
Civilian, Personnel	3,446
Civilian, Dependents	5,169
Military, Students	<u>6,132</u>
Total	43,976

Sources: U.S. Department of the Army 1986.  
Van Horn Gray Associates 1989.

The sale of goods and services is an indicator of the types of economic activities and their importance in a local economy. Total sales during FY 1987 in the county amounted to \$1.38 billion. The largest category of sales was in food and beverages, signifying the importance of the tourism industry in the county.

Tourism is an important component of the Harrison County economy, as noted before. Lodging, restaurant, and lounge businesses employ an estimated 8,000 persons, according to the Mississippi Employment Security Commission. Convention trade by the major hotels and Mississippi Coast Coliseum and Convention Center have increased steadily over the past decade and is a primary factor in the tourism industry.

The State Port of Gulfport is another significant component of the county economy. With completion of the Tombigbee Waterway, waterborne transport shipments are projected to increase substantially over the next 20 years, although initial activity has not met expected levels. The port has deepwater facilities, a foreign trade zone, and is the primary port in the United States for receiving imports of bananas. The port is capable of handling over 1,000 ships and 1.5 million tons of cargo annually.

As noted above, federal installations are also essential components of the economy. Keesler AFB is one of the world's largest electronic training facilities. Military personnel from other countries train at the base, in addition to U.S. military personnel. The Naval Construction Battalion, Atlantic Fleet, in Gulfport is one of the two "Seabee" facilities in the United States. John C. Stennis Space Center in Hancock County is a NASA facility and is also the site of the State of Mississippi Technology Transfer Center and a National Oceanographic and Atmospheric Administration office. The Technology Transfer Center administers a NASA-funded space-commercialization program.

#### 3.2.4 Employment Characteristics

Labor availability in Harrison County and the 3-county Mississippi Gulf Coast region is excellent. The civilian labor force in Harrison County averaged 73,330 in 1988, according to the Mississippi Employment Security Commission. Monthly unemployment rates in 1988 ranged from a low of 6.3 percent in April to a high of 9.0 percent in November. The average annual unemployment rate for 1988 was estimated at 7.8 percent. The southern part of the state has had traditionally higher unemployment rates than the state or national averages. The number of persons in the civilian labor force in Harrison County has risen from 62,750 reported in 1980, when the average annual unemployment rate was 5.6 percent. During the 1980s, the average annual unemployment rate peaked in 1983 at 10.2 percent.

Government employees have traditionally comprised the largest civilian employment sector in Harrison County. While persons employed in this sector have increased from 14,600 in 1980 to 15,070 in 1988, the percentage of county establishment-based employment in this sector has declined from 28.1 percent to 25.9 percent.

Several significant factors influenced the regional labor market during the 1980s. High unemployment levels in the mid-1980s were due to layoffs at Ingalls Shipyards in Jackson County. In less than 4 years, employment at Ingalls was reduced by about 15,000 persons, affecting all of the Mississippi Gulf Coast region. Recent shipbuilding contracts have mitigated this situation to some degree. The downturn in the oil industry in the Gulf has also led to job cutbacks among companies reliant upon oil and its support activities. The seafood industry has also experienced several poor seasons. These economic factors have been offset by gains in other employment sectors in Harrison County recently, a trend which is anticipated to continue as the county's economic base diversifies.

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### 3.2.5 Income

Median family income in 1989 in Harrison County is estimated to be \$25,800 compared to \$32,876 nationally. Median family income in 1979 in Harrison County was estimated to be \$15,627. Adjusting the 1979 figure for inflation using the Consumer Price Index reveals that families in the county have actually gained, since the adjusted 1979 figure equals \$22,405 in 1989 dollars.

Estimates for the 1989 per capita income, distribution of household income, and average household income in Harrison County have been prepared by Urban Decision Systems for Mississippi Power Company. Per capita 1989 income in the county is reported at \$10,320, median household income at \$21,623, and average household income at \$27,090. About one-third of the households in Harrison County earn more than \$30,000, and one-third earn less than \$15,000. Per capita 1994 income in the county is projected to be \$12,831, median household income of \$26,216, and average household income at \$32,394.

### 3.2.6 Land Use

Harrison County has an appointed Planning Commission, which is responsible for the County Comprehensive Plan. The Comprehensive Plan addresses land use and other issues in the unincorporated areas of the county. Subdivision regulations and a flood prevention ordinance have also been adopted by the county, but land in the unincorporated areas is not zoned. The cities of Biloxi and Gulfport have comprehensive plans, zoning and subdivision regulations, and flood prevention ordinances. The county and the two cities maintain a building and housing permit system, with adopted codes for building, housing, plumbing, electrical, and gas connections. Keesler AFB, as a United States military facility, is under federal jurisdiction and not subject to local comprehensive plans and land development regulations except as a matter of base policy on intergovernmental coordination. As discussed in Section 3.1.7, AICUZ regulations have been waived for Keesler AFB because of the level of

activity and almost all areas with sound levels above  $L_{dn} 65$  are on-base or over water (Figure 3-1).

Land uses adjacent to the base are well established, and no significant changes are anticipated by the Comprehensive Plan for Biloxi, according to City of Biloxi Community Development Department staff. Land use immediately east is predominantly residential. Further east lies the downtown area of Biloxi at the eastern tip of the peninsula. Between Irish Hill Drive and U.S. 90 on the southern side of the base is a single family residential area and a school. Commercial and recreational uses line Highway 90 south of the base fronting on Mississippi Sound (Figure 1-1). West of the base, land is also residential in character, with commercial strip development along Pass Road. The Veterans Administration Medical Center is located in this area, as well. North of the base is the Back Bay of Biloxi.

The most recent Comprehensive Plan for Biloxi was completed in 1979. The Land Use Element of the plan identified approximately 2,975 acres of low-density residential land uses, 858 acres of medium- and high-density residential uses, 884 acres of commercial uses, and 134 acres of industrial uses. Actual land uses covered 4,879 acres of the total 7,057 acres of zoned land in the city. Over 1,300 acres of vacant, zoned residential land existed in the city at the time the plan was implemented. The plan noted that 1,329.8 acres of land for Keesler AFB was not under city jurisdiction, but recognized the importance of this facility for the city and stated that future coordination of common needs between the base and the city would support "sound and progressive growth" for the city.

### 3.2.7 Housing

The 1980 Census of Housing reported 57,954 total housing units in Harrison County. Owner-occupied units totalled 32,451 (56.0 percent) and renter-occupied units totalled 19,751 (34.1 percent). Vacant units

accounted for 5,410 units, or a vacancy rate of 9.3 percent. Units held for seasonal and occasional use were estimated at less than 1 percent of the inventory. Over 60 percent of the housing units had been constructed since 1960, and consequently, most units were reported as being in sound condition.

Current housing inventory estimates indicate about 38,300 owner-occupied units and 23,797 renter-occupied. Vacancy rates still range between 5 and 10 percent on an annual basis, so available inventory offers a wide selection of housing types in both for-sale and for-rent units. Based on community surveys by Mississippi Power Company, housing availability remains good. Housing affordability also remains satisfactory, given average income levels and recent sales prices for homes. The average price of a three-bedroom, two-bath detached single-family house in 1988 was \$60,800.

### **3.2.8 Transportation System**

The transportation system along the Mississippi Gulf Coast is one of the best attributes of the region. Easily accessible modes of transport include inland navigable water, rail, interstate highway, general and commercial aviation, and deepwater ports.

The roadway network in the county links with Interstate 10, which is the county's primary east-west surface transportation corridor. The coast is bordered by U.S. 90, a 4-lane arterial road. State Road 15 provides north-south access from Biloxi and is paralleled by the recently completed I-110 Connector to I-10. U.S. 49 provides north-south access from Gulfport. State Roads 53 and 67 are located in the county. Major local roadways in Biloxi include Pass Road, which is an east-west arterial route terminating on the west perimeter of Keesler AFB, Irish Hill Drive, which borders the south side of Keesler AFB, Porter Street, Division Street, and Howard Street. Mass transit services are provided to Biloxi and Keesler AFB by Coastal Area Transit, a regional transit system. Greyhound and Trailways serve the area with interstate bus lines.

Four principal problems with traffic at Keesler AFB have been identified. A lack of parking, several problem intersections, and traffic congestion at peak travel times creates circulation problems. The base has undertaken to improve these problem areas through implementation of the recommendations provided in a recent Military Traffic Management Command study, including new signage, signalization, and limiting student vehicles on-base.

### 3.2.9 Public Utilities and Services

Harrison County and the county municipalities draw their potable water from groundwater sources. The artesian aquifers used for supply provide water which meets or exceeds drinking water standards. Biloxi maintains a 15.0-MGD system with storage capacity of 5.0 MGD (2.0 MGD elevated). Peak demand is approximately 12.0 MGD. Gulfport maintains an 12.0-MGD system with storage capacity of 3.0 MGD. While saline intrusion has not been a problem in the past with these coastal wells, increased salinity has occurred at wells in the Gautier area in adjacent Jackson County.

Keesler AFB has 12 deep water wells to supply its potable water. The water supply distribution system at the base is adequate, although its age and local soil conditions have caused some deterioration in the underground cast iron pipes. The base has a replacement program underway. The system is sized to accommodate larger personnel complements than current demand. Water wells serving the base are almost 50 years old, having been installed when the base was constructed during World War II. Well depths have been extended several times, due to a problem with draw-down, but some of the wells are being recased and deepened to alleviate the problem. The Keesler AFB water supply system also serves the Veterans Administration Hospital.

The Harrison County Wastewater Management District, and the cities of Biloxi and Gulfport provide sanitary sewers and wastewater treatment services in the region. The Biloxi system has a capacity of 4.2 MGD,

and 98 percent of the city utilizes sanitary sewers. There is no sewage treatment plant at Keesler AFB. Wastewater from the base goes to a regional wastewater treatment plant. The wastewater collection system (sewerage) is adequate, but there is a problem with the lift station pumping to the regional treatment plant west of the base. This lift station is connected to the treatment plant via an 18-inch force main. The size of this main permits only 2 of the 3 pumps at the lift station to operate at any given time. Even with a 100,000-gallon static holding capacity, the system overflows during heavy rains and discharges the overflow to Back Bay of Biloxi by way of a drainage ditch.

Electrical power in Harrison County is supplied and distributed by Mississippi Power Company and Coast Electric Power Association. Coast Electric Power Association operates a coal-fired generating plant in the county. Generating capacity is rated at 1.97 million kilowatts (kW), with system demand at 1.59 million kW. Adequate electrical power capacity to serve the county is available, according to the Southern Mississippi Planning and Development District.

Natural gas is distributed by ENTEX, Inc., which is supplied by United Gas Pipeline Company. Fuel oils and liquid propane are available from local suppliers. The natural gas distribution system on-base has problems similar to the water distribution system, due to the age and condition of the metallic pipes. An annual gas leak survey is conducted and several lines have already been replaced with high-density plastic pipe. Adequate natural gas supply to serve the county is available, according to the Southern Mississippi Planning and Development District.

Solid waste collection services in the county are provided by private contract haulers. Disposal is at sanitary landfills. Recent EPA regulations are going to result in the closure of all except 2 solid waste landfills and 1 incinerator in the state of Mississippi within 18 months. Therefore, additional personnel assigned to Keesler will

have a major impact on the amount of solid waste since space to landfill this material will be at a premium.

South Central Bell Telephone Company provides local telephone services. Several long distance carriers are available. There are two local television stations, WLOX and WXXV, and cable television service is available from Post-Newsweek Cable Company. Radio stations in the region include 12 AM and 12 FM stations. Two daily newspapers are published locally, the Sun-Herald and the Mississippi Press. Keesler AFB also has its own newspaper.

Branch campuses of the University of Southern Mississippi and William Carey College serve local higher education students. The University of Southern Mississippi also provides some classes at Keesler AFB. Mississippi Gulf Coast Community College branches also serve the area, and include vocational-technical training programs. Harrison County has five public school districts. Biloxi Municipal Separate School District had 11 elementary schools and 1 secondary school with a student enrollment of 6,756 during the 1987-88 school year. Five private and parochial schools in the city had an enrollment of 966 during the 1987-88 school year. The schools have adequate capacity to accommodate new students.

On the peninsula, the Cities of Biloxi and Gulfport provide municipal public safety services. Mutual response and aid agreements have been signed by the county and the two cities. Harrison County is responsible for public safety services in the unincorporated areas of the county. Harrison County and the State Highway Patrol are responsible for law enforcement in the unincorporated areas of the county. Keesler AFB also provides its own fire protection, emergency response assistance, law enforcement, and security.

Five hospitals and four medical clinics are located in Harrison County. There are two significant federal facilities in addition to the

excellent public and private medical facilities. The Veterans Administration Medical Center is a 1,133-bed facility providing medical, surgical, and psychiatric services. The United States Air Force (USAF) Medical Center Keesler at Keesler AFB is the second largest in the United States.

### **3.2.10 Installation Restoration Program**

In 1980, the United States Air Force began implementing the Department of Defense Installation Restoration Program (IRP). The IRP is designed to identify and fully evaluate suspected contamination associated with past hazardous waste disposal practices and to control hazards to human health and the environment resulting from past operations. The Comprehensive Environmental Response, Compensations, and Liability Act as amended by the Superfund Amendments and Reauthorization Act is the Federal Law implemented with the IRP.

The IRP at Keesler AFB has progressed through two major steps. Phase I, now known as the Preliminary Assessment/Site Investigation (PA/SI), was conducted in 1984 (Engineering-Science 1984). It identified twelve sites as having the potential for causing environmental contamination. Subsequent reviews identified three additional sites where underground fuel storage tanks had been abandoned. In 1987, a Remedial Investigation/Feasibility Study (RI/FS) (ESE 1987) of 14 sites was begun (the Gasoline Spill at the Naval Reserve Park had been adequately investigated/cleaned up at the time of occurrence). These types of studies, consisting mostly of investigation-type activities, typically show some measurable levels of contamination that, while not serious enough to cause immediate concern, do warrant some additional investigation and assessment. If needed, additional work will be conducted in FY 90.

### **3.2.11 Cultural Resources**

As an area with a rich history, and an aboriginal as well as early colonial settlement, the possibility exists that archaeological or historic

artifacts may be uncovered during construction. If artifacts are found, prescribed procedures for recording, preserving, or recovering them will be followed. Any such finds will be reported to the Mississippi State Office of Historic Preservation (Hase 1989). Utilization of the existing facilities at the base is unlikely to impact significant archaeological resources. No historic or cultural resources listed or eligible for listing on the National Register of Historic Places exist on Keesler AFB property. The nearest historic sites are located in the city of Biloxi, but are not within the immediate project vicinity on-base and will not be impacted. Designated historic districts in the city include Point Cadet Waterfront, Howard Avenue, Water Street, and East Beach Biloxi. Developments in these districts are reviewed by the city to ensure design compatibility, and sensitivity to existing district character. There are no known historic sites in the vicinity of the NEXRAD antenna site.

#### **4.0 ENVIRONMENTAL AND SOCIOECONOMIC CONSEQUENCES**

##### **4.1 DIRECT EFFECTS AND THEIR SIGNIFICANCE**

This section addresses the environmental and socioeconomic impacts of relocating the Weather Training Division from Chanute AFB (Rantoul, Illinois) to Keesler AFB (Biloxi, Mississippi) as part of base closure and realignment policy. Both positive and negative effects of the action must be considered to determine what impacts the relocation of the Weather Training Division and reallocation of personnel authorizations will have on Keesler AFB and the surrounding area.

##### **4.1.1 Physiography and Topography**

No significant direct effects on the geology, topography, or sediments of the area are anticipated from the action.

Soil erosion may temporarily increase at the construction site of the Weather Training Facility and associated antenna field. Some soil erosion could occur during the removal of the impervious parking area surfaces and during demolition of the two existing buildings at the site. Subsequent excavation for the building foundation could cause additional temporary, localized erosion. The soil at the proposed construction site is Eustis loamy sand. Soil blowing is a potential problem for this soil type when the soil is left bare and unprotected during a dry period (Smith 1975). These impacts can be minimized by designing an interim site drainage plan utilizing proper erosion protection techniques including silt fences.

The Dormitory, Dining Hall, and existing training facility (Building 4331) renovation projects are not expected to significantly affect surrounding areas, because most renovations to these facilities are planned for the interior of the buildings. It will not be necessary to expose soils previously protected by plant cover or pavement at these three locations.

The NEXRAD radome and tower will be constructed northwest of Keesler AFB in the De Soto National Forest. The soils in the area of the proposed site are Ruston fine, sandy loam (RuB and RuC) and the slope ranges from 2 to 8 percent. These soils have slight to moderate erosion potential, moderate permeability, and medium to high water capacity. Proper erosion control techniques during construction will prevent significant negative impacts on the local soils.

#### 4.1.2 Surface Water

Surface waters are not expected to be significantly impacted by the construction of the Weather Training Facility. Because Eustis soils have moderately rapid permeability, and the slope at the Weather Training Facility site is less than 5 percent, very little runoff is expected (Smith 1975). Some soil erosion could occur during the removal of the impervious parking area surfaces and during demolition of the two existing buildings at the site. Subsequent excavation for the building foundation could cause a temporary, localized decrease in the quality of water receiving the stormwater runoff. Contractors will minimize the effects of runoff during construction by following standard erosion and sedimentation control measures including the use of silt fences. No significant increase in paved area is projected, so significant impacts are not expected on estuarine water quality due to accumulated pollutants washing from impervious surfaces.

No impact on surface waters is expected during renovation of the Dormitory, Dining hall, or existing training facility (Building 4331) since the majority of this work will be done on the interiors of these facilities. Pollutants (if any) which accumulate on pavement due to operation of construction machinery should affect stormwater runoff only slightly.

The area in which the NEXRAD antenna will be located is near the headwaters of Howard Creek. Stormwater runoff during construction of the radar antenna pad could temporarily wash eroded soils and accumulated petroleum residuals from construction vehicles into the creek.

However, considering the size of this pad (approximately 25 feet by 25 feet) and the limited amount of construction required to construct it, the impact of this runoff is expected to be minimal.

Surface waters (particularly Back Bay of Biloxi) could be impacted by additional amounts of sewage which overflow from the final lift station on-base during heavy rainfalls. As described in Section 3.1.4, sewage is pumped off-base to a regional treatment facility. However, the lift station on-base is operating near or at capacity and is restricted by the 18-inch main pipeline connecting it to the regional facility. The size of this line only permits 2 of the 3 pumps to operate at any one time. The base will conduct a total collection system survey in FY 90 to determine the needs of the base and modifications necessary.

#### 4.1.3 Groundwater

No significant increase in water usage is anticipated due to construction or operation of the Weather Training Facility, renovation projects, or construction of NEXRAD. Thus, the regional groundwater resources of the Biloxi area will not be directly impacted by this project.

Because Executive Order 12088 (Federal Compliance with Pollution Control Standards, October 13, 1978) requires that the handling and disposal of hazardous wastes generated from facilities meet all federal, state, and local regulations, no significant impact on groundwater quality is expected. In addition, no underground storage tanks will be installed during construction or operation of these facilities (Henckell 1989).

#### 4.1.4 Air Quality

No significant decrease in regional air quality is expected as a direct result of operation of the Weather Training Facility, NEXRAD system, or renovation projects. However, some localized temporary effects on air quality are expected as a result of the construction. Potential air emission sources would primarily include diesel construction equipment and emissions from vehicles transporting workers and materials. Because

of the limited amount of construction traffic expected, emissions should be relatively small. No emergency generators are planned for the Weather Training Facility or at the NEXRAD antenna site.

During demolition of the two existing buildings and construction of the Weather Training Facility and NEXRAD antenna pad, temporary increases in dust emissions are likely in the vicinity of the construction sites. Most dust generated will typically be of large particle size and settle out close to the source. The finer components of these dusts [i.e., those less than 10 um (micrometers) in diameter] would remain suspended in the atmosphere. Modern methods of dust control will be used, in order to ensure that fugitive dust emissions comply with Mississippi air quality regulations which require that all reasonable precautions be taken to prevent fugitive dust emissions.

Asbestos is known to be present in Building 4304 which is slated for demolition to make way for the Weather Training Facility (Rackard 1989). The asbestos is present in pipe insulation, in the vicinity of the boiler, and the exterior siding (asbestos shingle siding) which is friable when removed. Proper removal and disposal techniques will be utilized to ensure the safety of construction workers. Compliance with state and federal regulations including National Emission Standards for Hazardous Air Pollutants (NESHAPS) will be met. Asbestos removal has been included in the \$290,000 cost of demolition (USAF 1989a).

#### **4.1.5 Noise**

No significant noise impacts are expected by operation of the Weather Training Facility or NEXRAD system, or by usage of the renovated facilities.

Construction of the Weather Training Facility and associated antenna field is expected to occur over an 18-month period. The following construction activities will take place on the site: demolition of the two existing buildings, ground clearing, excavation, foundation and building

construction, installation, and finishing. Heavy machinery will be required for earth-moving, materials handling, and construction. Table 4-1 lists maximum permissible limits for various construction equipment. The values listed are intended to provide reference levels which can be expected from construction equipment in the area. The Weather Training Facility is located near an active airfield, in an area which experiences approximately 77-dBA noise levels. Since these values are on a logarithmic scale, they cannot be added. Addition of a 75-dBA source to an area experiencing 80-dBA noise levels results in noise levels of 81 dBA. If the difference in noise levels between two sources is greater than 10 decibels, the combined noise level is essentially that of the louder source (Liptak 1974). Therefore, the noise levels generated by construction activities are not expected to significantly affect human activities already being conducted in the area.

The NEXRAD radome and tower are slated for construction in a wooded, unpopulated area northwest of the base in the vicinity of the Air Force firing range. Due to the limited amount of construction required at this site, construction noise is not projected to impact human activities in the vicinity.

The Dining Hall and Dormitory slated for renovation are both located in areas which currently experience DNL noise levels ranging from 70 to 80 dBA. Construction noise caused by indoor renovations is expected to be minimal. .

Since the Weather Training Facility and the facilities to be renovated are in areas with 70- to 80-dBA noise levels, noise reduction measures and sound attenuation factors will be incorporated in the building designs to reduce the impacts of external noise on the students. These factors will be considered during completion of the final design process.

Table 4-1. General Services Administration Construction Noise Maximum Permissible Limits

Equipment	dBA
EARTHMOVING	
Front Loaders	75
Backhoes	75
Dozers	75
Tractors	75
Scrapers	80
Graders	75
Trucks	75
Pavers	80
MATERIALS HANDLING	
Concrete mixers	75
Concrete pump	75
Cranes	75
Derricks	75
STATIONARY	
Pumps	75
Generators	75
Compressors	75
IMPACT	
Pile Drivers	95
Jack Hammers	75
Pneumatic Tools	80
OTHER	
Saws	75
Vibrator	75

Note: All noise limits in dBA are instantaneous values measured at a distance of 50 feet from the equipment.

Source: SOUTH DIVNAVFACENGCOM 1986b.

#### **4.1.6 Vegetation**

Except for the possible removal or destruction of any existing herbaceous vegetation and lawn grasses during construction of the Weather Training Facility, no terrestrial vegetation will be directly impacted by the project. It is the policy at Keesler AFB to preserve significant natural resources. Therefore, mature live oaks existing in the vicinity of the Weather Training Facility construction site will not be affected by the action. No significant impacts to the terrestrial vegetation are expected from the renovations of the Dining Hall, Dormitory, or existing training facility (Building 4331) because most renovation is scheduled for the inside of the buildings. It will not be necessary to remove existing vegetation during renovation projects. Construction of the NEXRAD radar antenna will result in the elimination of approximately 10,000 square feet of natural pine forest or partially cleared areas. Aquatic flora would not be directly affected by any of the construction/renovation projects, because all project sites are located in upland areas.

#### **4.1.7 Wildlife**

Wildlife and wildlife habitat will not be significantly impacted by the construction or operation of the Weather Training Facility. Given the urban nature of the existing construction site, no change in occurrence of wildlife species at Keesler AFB would be expected as a result of construction. No direct impacts to wildlife would be caused by the renovation of the Dormitory, Dining Hall, or existing training facility because these projects will take place indoors. Construction of the NEXRAD radar antenna will have no direct affect on wildlife, other than the possible removal of wildlife habitat, including a small number of pine trees and approximately 10,000 square feet of understory vegetation. The construction site is adjacent to a U.S. Air Force firing range. No direct impacts to wildlife are expected to occur during future operation of the NEXRAD system (USDOC 1984). The frequency emitted by NEXRAD (2,870 or 2,880 megahertz) and the three pulse-repetition frequencies from 500 to 1,200 pulses per second (Morton 1989) are

well above the extremely low frequencies (0 to 100 hertz) known to affect some animals (USDOC 1984). However, operational aspects and impacts will be further evaluated when a specific antenna site is determined.

Since all renovation and construction sites are upland, no aquatic animals would be directly affected by any of the projects.

#### 4.1.8 Demographics

Student loadings and permanent party personnel at Keesler AFB will increase from present levels as a result of the training activities realignment from Chanute AFB. Current student loadings at Keesler are at a historical low. Student loadings for Weather Operations Division at Chanute average about 376 daily, with approximately 10 to 12 officers.

Students in the Weather Equipment Division average about 100 daily. The length of stay averages 51 days for TATB (Weather Course - Technician), 112 days for TATC (Weather Course - Officer), and 12 days for TATD (Advanced Weather Course - Officer), with all classes normally full. Permanent party military personnel and civilian employees to be transferred include an estimated 20 officers, 158 enlisted personnel, and 65 civilians, totalling 243.

Chanute AFB Housing Services reports about 2.5 dependents per unit, each with an average of 1 spouse and 1.5 children. The number of incoming personnel with spouses is reported to be 154, with an additional 385 dependent children. The estimated change in permanent area resident population is 782, which includes military personnel, civilians, and dependents. In addition, the average student population is expected to be 476 at any given time. Dependent children are estimated to include 195 under age 5 years, 116 between the ages of 5 and 12 years, and 74 between the ages of 12 and 18 years.

Combining the estimated permanent population increase with the average student increase to the area, the total population increase will average

1,258 persons at any given time, depending on the number of students assigned to the base for training. This increase is less than 1 percent (0.7 percent) of the current county population estimate of 169,421. The projected personnel at Keesler in FY 92 without the additional personnel from the realignment of activities from Chanute AFB is 12,903, including 7,963 permanent party and 4,939 students. Permanent party personnel (military and civilian) will increase by 3.1 percent and student population will increase by 9.6 percent.

#### 4.1.9 Economic Activity

Economic activities resulting from the relocation of the Weather Training Division to Keesler AFB include temporary construction employment, increased materials and services procurement for construction activities, increased employment on a permanent basis, increased indirect (secondary) employment due to increased population and income in the region, and increased sales of goods and services on a permanent basis.

Dormitory and Dining Hall renovation is a FY 91 project and construction of the Weather Training Facility and associated projects is a FY 90 project. The project cost estimate for alteration of the Dormitory and Dining Hall is \$1.5 million. The project cost estimate for construction of the training complex and other facilities for Weather Operations and Weather Equipment activities is \$8.6 million. These activities will be initiated in October 1989 and completed by May 1992, according to relocation timeline estimates prepared by the Air Force. By July 1992, the first classes to be taught at Keesler AFB are to begin.

The total economic impact of Keesler AFB on the region was estimated at \$365.7 million in 1986, according to the Economic Resource Impact Statement. Military payroll totalled \$286.6 million, and civilian payroll totalled \$76 million. Additional income from payroll for the additional personnel assigned to Keesler AFB is addressed in the Income section below. The estimated value of services and supplies attributable to the realigned activities for expenditures to contractors is \$1.44 million

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annually. The estimated value of operations and maintenance expenditures attributable to the realigned activities is \$575,000 annually.

Per capita retail expenditures for the 782 permanent residents estimated to be attributable to the realigned activities will be approximately \$2.31 million. Expenditures for housing and utilities will also have a direct positive impact on the region. Expenditures by students will have different characteristics, since they will be housed on-base. However, some of their income will be spent in the regional economy, adding to the net gain in expenditures.

#### 4.1.10 Employment

As noted in Section 4.1.8, permanent party military personnel and civilian employees to be assigned to Keesler AFB as part of the relocation of the Weather Training Facility include an estimated 20 officers, 158 enlisted personnel, and 65 civilians, totalling 243. Direct permanent employment will therefore be 243, plus an undetermined number of workers for independent contractors supplying goods and services for the realigned activities.

Indirect employment will include workers supported in the region by additional expenditures in the regional economy derived from increased local income. The number of spouses estimated to seek work in the region is 92. Although the region has had a relatively high unemployment rate during the past decade, recent employment increases indicate a strengthening of the economy, and more support for added jobs.

#### 4.1.11 Income

Using military and civilian pay scales, and assuming a mid-range for each grade, estimates of increased income attributable to the realigned activities can be derived. The average rank for students is AlC, with time in service typically less than 2 years. Sergeants average 6 to 10 years service. The estimated annual basic payroll derived from the

realigned activities is approximately \$611,000 for officers, \$2.4 million for enlisted personnel, \$1.88 million for civilian employees, and \$4.9 million for students. These figures are shown in Table 4-2 and do not include Basic Quarters Allowance, Incentive Pay, or Subsistence Pay for military personnel.

The total estimated annual payroll for permanent personnel is about \$4.9 million. Most of this income will stay in the region in the form of living expenses, savings, and investments. Student payroll, based on an average of 476 students at a given time, is also about \$4.9 million annually. Expenditures by students will have different characteristics, since they will be housed on-base. However, some of their income will be spent in the regional economy, adding to the net gain.

#### 4.1.12 Land Use

No significant land use incompatibilities between the base and the city were identified. Land use on-base is largely set, as much of the base is developed and the locations of the new facilities have been determined. Installation of the NEXRAD radar antenna on military property in the National Forest will not conflict with the current use of the adjacent firing range since all shooting is in the opposite direction from the proposed area for the NEXRAD site.

#### 4.1.13 Housing

Estimates provided by Keesler AFB personnel indicate that 90 percent of the incoming military personnel and all of the civilians will be housed off-base due to the lack of vacancies in base housing. Based on this estimate, approximately 225 housing units will be required for the 243 permanent employees and their families. The city of Biloxi had 176 for-sale and 653 rental units vacant as of February 1988. The housing inventory in the region has sufficient vacancies and selection to accommodate the incoming personnel. The Triangle housing area (student dorms) on-base will be used to house the students.

Table 4-2. Estimated Annual Basic Payroll for Personnel Associated with  
the Relocated Weather Training Division to Keesler AFB

Rank	Number
Officers	\$ 611,000
Enlisted	2,432,000
Civilian	<u>1,878,000</u>
Subtotal:	4,921,000
Students	<u>4,906,000</u>
Total:	\$9,827,000

Source: Van Horn Gray Associates 1989.

#### **4.1.14 Transportation System**

Coastal Area Transit has four or five bus stops on-base. Most students will not have vehicles although parking is adequate in the Triangle housing area (student dorms). Construction of parking areas at the Weather Training Facility should provide adequate parking for instructors and staff.

#### **4.1.15 Public Utilities and Services**

The existing water distribution system is adequate to meet the needs attributable to the construction of the Weather Training Facility and use of the renovated buildings. There are existing 8-inch water lines on three sides of the proposed Weather Training Facility site. Well #5 is located one block south and is rated at about 500 gallons per minute (gpm) at 70 pounds per square inch (psi).

Wastewater generated will be primarily domestic sewage. Using a wastewater generation rate of 105 gallons per day for students, less than 100,000 gallons of wastewater per day will be generated on-base, primarily at the housing area and training facility. There is an existing 8-inch gravity sanitary sewer line on the north side of the Weather Training Facility site. Wastewater will be pumped through the existing sewerage system to the Regional Treatment Facility, which has adequate capacity to handle the additional loading. However, as noted previously, additional amounts of wastewater will further stress the final lift station on-base which is currently operating at or near capacity. During periods of heavy precipitation, the incidence of overflow will increase, and untreated wastewater containing oils, grease, fecal coliform bacteria, and solids will overflow into a drainage ditch which empties into Back Bay of Biloxi. As noted in Section 3.1.4, the lift station is restricted by the size of the pipe connecting it to the Regional Treatment Facility. This 18-inch pipe permits only 2 of the 3 pumps at the lift station to operate at any given time. A total collection system survey will be conducted in FY 90 to determine the needs of the base and modifications needed.

Electrical power supply will be provided by the existing base electrical distribution system. The primary distribution line has adequate spare capacity to supply the added load imposed by projects attributable to the realigned activities. The Weather Training Facility will require substantial power due to the extent of electronic training equipment and equipment cooling requirements for the facility. The actual amount of electrical power required for the facility will be determined during the final design process. Standby electrical power is not required for the Facility.

The Weather Training Facility will be connected to an existing chiller plant (Building 4309) for cooling. Natural gas will be used for heating. The target energy budget figure for this facility is 40,000 British thermal units/square foot/year (Btu/SF/YR). Each of the dormitories has a self-contained heating plant with two gas-fired 3.58-million Btu/hour boilers. Natural gas supply is adequate to meet the needs attributable to these projects. If modifications or extensions of the existing chiller plant are required for the Weather Training Facility, these will be addressed during final design determinations.

Disposal of all solid wastes will be in accordance with federal, state, and local regulations. Solid waste collection and disposal will be impacted by additional people in the area since space for solid waste will be at a premium. Recent EPA regulations will result in closure of all except 2 solid waste landfills and 1 incinerator in the state of Mississippi within 18 months. Construction waste will be the responsibility of the contractor(s).

An estimated 190 school-age children will accompany incoming personnel. At a standard ratio of 1 teacher per 25 students and 1 administrative employee per 70 students, about 10 elementary and secondary school employees will be required for the new students. It is likely, however,

that the student population will be distributed among several school districts and the impact will be accommodated by existing system capacities.

The Air Force provides fire protection and emergency response services on-base. There are no formal interlocal agreements with local fire/-rescue departments. Automatic fire alarm and detection systems will be installed in the Weather Training Facility and dormitories. The Air Force provides security and law enforcement services on-base. There are no formal interlocal agreements with local police departments. The base is under federal jurisdiction, and the Air Force and/or the FBI are the investigating law enforcement agencies. Local police have jurisdiction in the cities and county.

As with any given population, bodily injuries and illnesses will occur among both the student and permanent population, requiring medical attention. Medical facilities available in the region and on-base are adequate to handle the increased incidence of injuries and illnesses attributable to the additional personnel, their dependents, and students.

#### **4.1.16 Installation Restoration Program**

The IRP program is independent of the action to relocate the Weather Training Division to Keesler AFB and will not be affected by this action.

#### **4.1.17 Cultural Resources**

No historic or cultural resources listed or eligible for listing on the National Register of Historic Places exist on Keesler AFB property. The nearest historic sites are located in the City of Biloxi, but are not within the immediate vicinity of the projects on-base or at the site for the NEXRAD radar antenna off-base, and will not be impacted by the project. As an area with a rich history, and an aboriginal as well as early colonial settlement, the possibility exists that archaeological or

historic artifacts may be uncovered during construction. Any such finds will be reported to the Mississippi State Office of Historic Preservation (Hase 1989). Renovation of the existing facilities at the base is unlikely to impact significant archaeological resources.

#### **4.2 INDIRECT EFFECTS AND THEIR SIGNIFICANCE**

In addition to considerations of direct effects, secondary or indirect effects must be considered. Relocation of the Weather Training Facility to Keesler AFB is projected to bring 243 permanent personnel into the area. In addition, there are expected to be 476 temporary personnel (students) at the facility at any one time. The families of the military and civilian personnel assigned to the Weather Training Facility will also increase the population of the region.

Secondary effects on the physical systems of the area are primarily associated with the increase of personnel to the area. Many of these personnel will own and use automobiles, contributing to noise and air pollutant emissions. Automobiles would also have a detrimental effect on surface water quality, by increasing the amount of petroleum residuals carried off roadways by stormwater runoff. Although sufficient homes are projected to be available to house the population increase, construction of any new homes could potentially cause temporary impacts on soil erosion and stormwater runoff similar to those described for construction of the Weather Training Facility.

The increase in population will mean an increase in the use of potable water, hastening the drawdown in municipal wells. Saltwater intrusion and water-level drawdown have been projected for the Gulf Coast area (Sumner, et al. 1987). These problems will increase as the population rises. The relatively small increase in population associated with this action will most likely not affect groundwater levels greatly. However, it is important for a region to anticipate cumulative impacts of small projects such as this when planning for future water uses.

Although wastewater treatment has been shifted off-base to a regional water treatment plant, Keesler AFB is still responsible for pumping wastewater to a city collection system which forwards it to the regional plant. The lift station on-base is currently operating at maximum capacity, and overflows in periods of heavy rain (Hase 1989). An increase in personnel will increase wastewater, thus increasing the frequency and amount of overflow following heavy rainfalls. Untreated wastewater containing oils, grease, fecal coliform bacteria, and solids will overflow into a drainage ditch which empties into Back Bay of Biloxi and could potentially affect water quality in this estuary. The base will conduct a total collection system survey during FY 90 to determine the needs of the base and necessary modifications.

Secondary effects on the biological systems in the area are also related to the influx of additional personnel assigned to Keesler AFB and their dependents. Although it is anticipated that sufficient housing exists, any home construction required for new personnel may result in the elimination of some upland vegetation and wildlife habitat. Increased personnel in the area would increase the utilization of fishing, hunting, and recreational resources in the area. Increased overflow of wastewater from the Keesler AFB wastewater pumping station during periods of heavy precipitation could potentially affect marine biota in Back Bay of Biloxi.

Socioeconomic effects include positive impacts on the regional economy through the secondary effects of income and employment generated by Air Force procurement of materials and services, and expenditures by personnel for goods and services.

#### **4.3 POSSIBLE CONFLICTS BETWEEN THE ACTION AND THE OBJECTIVES OF FEDERAL, REGIONAL, STATE, AND LOCAL LAND USE PLANS, POLICIES, AND CONTROLS**

There are no identified conflicts with local government land use plans, policies, or controls as a result of this project. Keesler AFB is a federal reservation and as such is not subject to local plans, policies,

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and controls, except as a matter of policy for intergovernmental coordination and community interest. All building construction, including any additional new housing, will be in areas zoned for that type of building. In addition, the design of the new Weather Training Facility will be compatible with existing buildings constructed on Keesler AFB since 1972.

#### 4.4 SHORT-TERM AND LONG-TERM IMPACTS OF THE PROJECT

Short-term impacts to physical systems are expected to primarily result from construction activities. Limited amounts of soil erosion will occur during construction of the Weather Training Facility and NEXRAD radome pad during surface preparation and excavation of footings. Surface water quality may decrease temporarily due to increased runoff from these activities. Noise levels near the construction and renovation areas will temporarily increase from the operation of construction machinery and power tools. Air quality may decrease temporarily as a result of gaseous emissions and airborne dust particles from operation of heavy machinery during demolition of existing buildings and construction of new facilities. Shallow groundwater aquifers may be affected by construction, but confined aquifers are not expected to be influenced by the project.

Short-term impacts to biological systems in the region are also expected to primarily result from construction activities. Short-term impacts would include the loss of vegetation at the construction sites and loss of wildlife habitat at the NEXRAD site. Considering the location of the sites and the scope of the projects, only limited changes in quality of stormwater runoff would be expected. Should increased turbidity in the storm water reaching Back Bay of Biloxi occur, it would have a minimal impact on the benthic invertebrate communities since the mobile aquatic organisms would be able to avoid local short-term reductions in water quality. Temporary elevations in noise levels and reductions in air quality at the proposed construction sites are not expected to significantly affect wildlife populations.

Socioeconomic short-term impacts on labor and income will also result from construction activities. The construction industry, which has declined in employment during the 1980s, will be impacted positively as a result of the construction activities associated with the relocation of the training missions from Chanute AFB to Keesler AFB. Traffic circulation and parking on-base during the construction phase may present a temporary reduction in convenience for drivers.

In addition to the short-term impacts of the action, the long-term impacts on the region must also be considered. No significant long-term impacts on the physical environment or biological systems are anticipated as a result of the renovation and construction projects. However, an increase in demand is expected on the recreational water facilities and fishing in the Biloxi/Keesler AFB area by the additional personnel assigned to the Weather Training Facility. Long-term impacts on the biota of Back Bay of Biloxi will also exist if the 18-inch main pipeline between the wastewater lift station on-base and the Regional Treatment Facility is not upgraded to increase its capacity.

Long-term resource commitments required by the project, primarily fossil fuels for energy and construction materials, will not be recoverable. Permanent employment, income, retail sales, and housing in the region will be impacted positively as a result of the realignment of the training missions from Chanute AFB to Keesler AFB. Potential demands for public services and demands on public facilities' capacities are likely to be more than offset by the increase in sales and property tax revenues generated by the activity.

#### **4.5 ENERGY REQUIREMENTS AND CONSERVATION POTENTIAL OF PROJECT**

Demolition of existing buildings, construction of new facilities, renovation of existing facilities, and operation of completed facilities associated with the action will require energy in the form of various fossil fuels, electricity, and natural gas. Additional amounts of energy will

be required by the influx of additional personnel to Keesler AFB and the surrounding areas. These energy requirements are not currently fully developed. However, the target energy budget figure for the Weather Training Facility is approximately 40,000 Btu/SF/YR. Electric power will be required for lighting, equipment, ventilation, and air conditioning in the facility. Natural gas will be used for heating. Adequate supplies of electricity and natural gas are expected to be available in the quantities required and should not have an effect on the local market (USAF 1989a).

During design of the Weather Training Facility, special emphasis will be placed on selection of materials and equipment that will require minimum maintenance efforts both in man-hours and expenditure of funds.

Emphasis will be placed on designing systems that will provide energy savings. In addition, the new facility will be connected to the Energy Management Control System (EMCS) for the base (USAF 1989a). It should also be noted that, at least on a national scale, the increase in energy consumption at Keesler AFB will be offset to some extent by reductions in consumption at Chanute AFB.

#### **4.6 URBAN QUALITY, HISTORIC AND CULTURAL RESOURCES, AND THE DESIGN OF THE BUILT ENVIRONMENT, INCLUDING THE REUSE AND CONSERVATION POTENTIAL OF THE ACTION**

The relocation of the Weather Training Division to Keesler AFB is not expected to degrade the urban quality on-base except for a slight increase in traffic congestion due to the additional personnel stationed at Keesler AFB. In fact, urban quality may actually improve on the base with the removal of several old buildings, construction of a new building (the Weather Training Facility), and renovation of the Dormitory and Dining Hall. These improvements should improve the overall appearance of the base and improve the quality of the built environment.

Historic and cultural resources of the area are not expected to be impacted by the action. The buildings on the proposed site of the Weather

Training Facility are not historically or culturally valuable. Conservation of historic or cultural resources would only be realized during surveys of the construction sites if any resources were determined to exist on the sites.

Short-term soil conservation at the construction sites will be aided by proper construction procedures and techniques. Long-term soil conservation will utilize landscape vegetation to stabilize and hold the soil in the vicinity of the completed facilities.

#### **4.7 PROBABLE ADVERSE ENVIRONMENTAL IMPACTS WHICH CANNOT BE AVOIDED SHOULD ACTION BE IMPLEMENTED**

Construction of the Weather Training Facility and the NEXRAD radar antenna pad will result in minor alterations to the topography of the sites. Alterations will be very minor at the Weather Training Facility since this site is essentially flat. Exposure of surface soils during construction will cause some erosion, especially due to stormwater runoff. Fugitive dust levels will temporarily increase and air quality will be reduced due to exhaust emissions in the immediate vicinity of the project sites during construction of the facilities.

Temporary increases in suspended solids loading due to soil erosion could occur during construction and renovation, impacting the quality of surface water in the immediate vicinity.

Construction of the NEXRAD antenna pad will result in the elimination of pine forest and wildlife habitat in an area approximately 10,000 square feet in size.

#### **4.8 MEANS TO MITIGATE ADVERSE ENVIRONMENTAL IMPACTS**

Adverse impacts resulting from implementation of the action can be minimized or reduced by the following procedures:

Correct health and safety procedures will be followed during demolition and removal of the building containing asbestos at the proposed site of the Weather Training Facility.

During construction and renovation of the facilities, noise-producing activities will generally be conducted during daylight or normal operating hours.

Soil conservation at the construction sites will be aided by proper construction procedures and techniques including proper soil erosion control. As soon as possible following completion of the facilities, disturbed areas in the vicinity of the facilities will be revegetated with natural or landscape vegetation to stabilize and hold the soil around the completed facilities.

During demolition and construction, equipment refueling, maintenance, and washdown areas will be designated to minimize pollutant loading runoff, and a sound spill containment plan will be implemented.

#### **4.9 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES**

The projects and associated demolition, construction, renovation, and operation of the completed facilities will require the commitment of resources including labor, capital, energy, building materials, and biological and land resources. The commitment of land resources should be considered long-term since the facilities are considered permanent. The land could be converted to alternative use after operation of the facilities is completed; however, this is not in the foreseeable future.

Construction of the NEXRAD radar antenna pad will result in the clearing of an area approximately 100-by-100-foot-square at the site. A security fence will be constructed around the site and will remain in place during the life of the project. The fence will act as a barrier to larger wildlife (excluding birds) and, thus, result in the loss of this wildlife habitat.

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The project will also require the commitment of various sources of energy (including electricity, natural gas, and petroleum products) to operate and maintain the facilities. Additional energy will be required by the new personnel assigned to Keesler AFB in connection with the action.

### 5.0 LIST OF PREPARERS

The following individuals affiliated with Water and Air Research, Inc. have assisted in the preparation of this document.

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